31F3B－R. 2021. A

Nikon

Nikkormat FT2

ニコマート FT2

REPAIR MANUAL

修 理 指 針

Nikon

NIPPON KOGAKU K.K.

Tokyo, Japan

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(75. 2. c) H-1

Correction list 正 誤 表
(Parts list 部 品 表)

Page ページ	Line 行	Mistake 誤	Correct 正
1	14	22	22-1
		FTN	-41
21	4	T36	T36-1
		FTN	-41
22	9	T359-2	T359-3
		FTN	-41
23	6	T618	T618-1
		FTN	-41
23	15	T628	T628-1
		FTN	-41
35	3	920-1	920-2
		FTN	-41

CONTENTS

I. Repair manual

1. Marks in the parts list 1
2. Lubricant and binding agent list ..... 3 - 4
3. Specifications 5
4. Note 7
5. Illustrations of Each Parts (Fig. 1 - Fig. 30) ..... 9 - 26
6. Schematic view of wiring (Fig. 31) 27
7. Nikkormat FT2 Exposure Meter
   §1. STANDARDS OF MAIN PARTS 28
   §2. TROUBLE CHART 30, 32, 34, 36
   §3. DISASSEMELING PROSEDURES OF THE EXPOSURE METER 38
   §4. MEASUREMENT OF EACH PART OF METER 40
   §5. ASSEMBLING OF THE EXPOSURE METER 42
   §6. ADJUSTMENT OF THE EXPOSURE METER 44
8. Assembling points 46, 48

II. Parts list

1. Parts list ..... 1 - 40
2. Subassembly list ..... 41 - 45

目　　次

I 修 理 指 針

1. 記 号 説 明 …… 2
2. 潤滑剤，接着剤一覧表 …… 3～4
3. 主 要 諸 元 …… 6
4. 注 意 事 項 …… 8
5. 展 開 図 (Fig1～Fig30) …… 9～26
6. 実体配線図 (Fig31) …… 27
7. ニコマート FT2 露出計修理指針
   - §1 主要部品規格 …… 29
   - §2 精度不良品の修理 …… 31,33,35,37
   - §3 露出計分解手順 …… 39
   - §4 部品の測定 …… 41
   - §5 組 立 …… 43
   - §6 露出調整 …… 45
8. 組 立 要 点 …… 47, 49

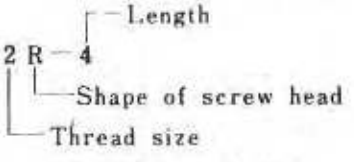
II 部 品 表

1. 部 品 表 …… 1～40
2. 部 組 品 表 …… 41～45

1. MARKS IN THE PARTS LIST

1. The name and shape column

⊕ ····· Cross recessed head screw
⊖ ····· Slotted head screw
P ····· Oval countersink head screw
Q ····· Flat head screw
R ····· Pan head screw, flat fillister head screw
S ····· Round head screw
T ····· Truss head screw
U ····· Set screw
U S ····· Set screw (cone point)



(1),(3) ····· 1st class, 3rd class
(S) ····· Special screw
d ····· Diameter of the material
T P ····· Taper pin
S P ····· Straight pin

2. The term of sale column

○ ····· Can be supplied individually
△ ····· Not supplied individually but only as subassembly
○△ ····· Supplied either as part or subassembly
× ····· Not considered as repair part
※ ····· Should be sent to the factory if the repair is needed
⊠ ····· Delivered as a product from the sales department (i.e., not supplied as repair part)

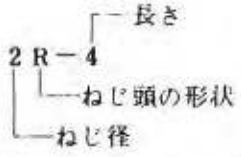
3. The remarks column

P-10001 ····· Part number used in common
D-2222 ····· Part number in stock
49F1001 ····· Technical data sheet number
-1×100/1000 ····· Starting order
Rev. ····· Revision
Add. ····· Addition
Dis. ····· Discontinuation
#1—#3 ····· Relative parts number

記　号　説　明

1．名　称　欄

⊕ ……十字穴付ねじ
⊖ ……スリワリ付ねじ
P ……丸サラ頭ねじ
Q ……サラ頭ねじ
R ……ナベ頭ねじ，平頭ねじ
S ……丸頭ねじ
T ……トラス頭ねじ
U ……止めねじ
US……止めねじ（とがり先）



(1),(3) ……1種，3種
(S) ……特殊ねじ
d ……線　径
TP……テーパーピン
SP……ストレートピン

2．販売区分欄

○ ……単独部品として販売するもの
△ ……部組品でなければ販売しないもの
○△……単独部品でも部組品でも販売するもの
× ……修理部品とは考えないもの
※ ……単体では交換できないので、組む場合に工場での加工が必要なもの
⊠ ……商品として販売店で販売しているもの（修理部品扱いはしない）

3．備　考　欄

P-10001……共通部品番号
D-2222 ……貯蔵品番号
49F1001……製品技術資料番号
～1×101／1000……実施オーダー
Rev. ……訂　正
Add. ……追　加
Dis. ……廃　止
#1－#3……関係部品番号

2. Lubricant and binding agent list 潤滑剤・接着剤一覧表

LUBRICANTS 潤滑剤

Oil 油	Usage 用途	Items number 番号	Items 商品名 Japanese 日本	Remarks 備考
Liquid oil 液体油	At a normal temperature 常温用	L 1212	日本石油 ダイスピンドル油 #5	
		L 1233	シェル石油 トナオイル #33	
		L 1309	モービル石油 モービルーブ HD80−90	
		L 1314	モービル石油 モービルーブ HD140	
	At a low temperature 低温用	L 2010	ウイリアム・エン・ナイ(木村産業) アストロオイル	
		L 2113	三建化工 D.O.S	
		L 2215	エクリプス・パイオニア エクリプス・パイオニア #10(ジャイロ油)	
		L 3016	理研製油 スクワレル LA−10	
		L 3025	理研製油 スクワレル M−1	
		L 3034	理研製油 スクワレル M−2	
		L 3044	理研製油 スクワレル M−5	
		L 3047	理研製油 スクワレル H−1	
Grease oil グリース	At a normal temperature 常温用	G 5201	社内調合	
		G 5204	社内調合	
		G 5214	社内調合	
		G 6053	日本鉱油 パーマルブ H1003	
		G 6252	出光興産 ダフニコロネックス 2	
		G 6372	シェル石油 シェルアルバニア 2	
		G 6414	杉浦研究所 光学用グリース Z−2	
		G 6433	杉浦研究所 光学用グリース X−2	
		G 7821	丸善石油 リマックス 2	
		G 8681	ロックレー(大東商事) リキモリオート LM−81	
	At a low temperature 低温用	G 7100	理研製油 スクリグリース L−2	
		G 7811	日本鉱油 フォートルブ 024	
		G 7812	日本鉱油 フォートルブ 025	
		G 7813	社内調合	
		G 7814	協同油脂 マルテンプPS #1	
		G 7815	協同油脂 マルテンプPS #2	
		G 7833	東レシリコーン シリコーンSH,33(F)グリース	
		G 7848	日本石油 ユニテンプグリース	
		G 7854	日本鉱油 パーマルブ C−1	
		G 7855	日本鉱油 パーマルブ C−2	

LUBRICANTS 潤滑油

Oil 油	Usage 用途	Items number 番号	Items 商品名 Japanese 日本	Remarks 備考
Grease oil グリース	At a low temperature 低温用	G 7856	日本鉱油 パーマルブ C 3	
		G 7862	日本鉱油 パーマルブ D 2	
		G 7866	日本鉱油 フォートルブ 023	
		G 7870	モービル石油 モービルグリース 27	
		G 8181	社内調合	
		G 8610	ロックレー(大東商事) リムリブースター LM-83	
		G 8613	ロックレー(大東商事) リモリパウダー LM-13	

BINDING AGENTS 接着剤

Usage 用途	Items number 番号	Items 商品名 Japanese 日本	Remarks 備考
For leather or rubber goods. 皮類, ゴム類	# 330	スミボンド VA−1000	
	# 501	ソライオボンド #30	
For make metal goods together with metal goods or glass with metal 一般金属相互 ガラスと金属	# 616	セメダインスーパー (家庭用) セメダイン#1500 (工業用)	
	# 621	セメダイン#1565	
	# 631	アラルダイト AT1	
	# 634	主剤 アラルダイト AY 101 硬化剤 ハードナー HY 951	
	#645HB, #645HE	DM K5	
For temporary adhesion in the process 工程上の仮止め	# 201	セラック オレンジ色, レモン色可	
	# 350	ねじロック	
	# 410	ロックタイト (B/M黄, ST/L赤 SC/L紫, N/L青, D橙	
	# 921	アロンアルファ # 201	
	# 922	アロンアルファ # 202	
For replenishment 充填を主とする接着	# 503	ウェザーバンシーラー	
	# 506	スリーボンド #4	
	# 508	シラシール 3DW	
	# 512	シラシール FSXS−1548	
	#646HB, #646HE	DM D6	
	#647HB, #647HE	DM K3	

3. Specifications

- Type: 35mm single-lens reflex camera
- Lens mount: Nikon F bayonet mount
- Viewfinder: Eye-level pentaprism; focusing screen consists of a matte Fresnel field with a central 3mmφ split-image rangefinder spot surrounded by a doughnut-shaped 1mm-wide microprism for fast, accurate focusing; frame coverage approx. 92%; shutter speed and aperture needle visible inside the viewfinder.
- Shutter: Metal focal-plane shutter with downward-vertical movement; speeds 1/1000 - 1 sec., plus B.
- Exposure meter: Thru-the-lens CdS meter with center-weighted metering at full aperture with Nikkor auto lenses; aperture coupling range f/1.2 - f/32; maximum aperture range f/1.2 - f/5.6; ASA range 12 - 1600; metering range EV3 - EV17(e.g., f/1.4, 1/4 sec. - f/11, 1/1000 sec. at ASA 100 with 50mm f/1.4 lens); power source single 1.5V silver-oxide battery
- Mirror: Automatic instant-return type with lock-up feature
- Self-timer: Can be set for approx. 8 sec. delay
- Frame counter: Additive, automatic resetting
- Film-advance lever: A single stroke winds film, cocks shutter and operates frame counter; serves as an on-off switch for the exposure meter; winding angle is with clearance angle
- Flash synchronization: At any speed, plus B, with flashbulbs and speeds up to 1/125 sec., with electronic flash units; synch selector adjusts for either bulb or electronic flash
- Synch terminal: Inner thread accepts Nikon synch cords for positive connection
- Accessory shoe: Hot-shoe contact provided
- Dimensions: 148mm × 96mm × 54mm
- Weight: 780g (body without lens)

3. 主 要 諸 元

- 形　式 ---------- 露出計内蔵
  35mmフォーカルプレーンシャッター式　一眼レフレックスカメラ
- 使用フイルム---------- 35mmフイルム
  パトローネ入り　36枚または20枚撮り
- 画面サイズ---------- 24 × 36 mm
- 標準レンズ---------- ニッコールオート
  50 mmF1.4，　50 mm F2，　55 mm F1.2，　距離目盛 ∞～0.6 m
- シャッター ---------- 上下走行式・メタルフォカルプレーンシャッター
  B1 1／2　1／4　1／8　1／15　1／30　1／60　1／125　1／250　1／500
  1／1000秒　等間隔目盛
  ヒルフタイマー内蔵（シャッター速度はファインダー内でも見える）
- ファインダー---------- ペンタプリズム使用　視野率92%
  アイレベルファインダー
  マイクロプリズム式（またはスプリット式）距離計内蔵
  マット面とフレネルレンズ使用
- ピント調節
  レンズの距離リングを回転し、ピントグラスに像を結ばせ、接眼部で見る。
- ミラー ---------- クイックリターン式
- 絞り込み ---------- ボデー上部の絞り込みボタンによる
- 巻き上げ ---------- レバー式　1作動　155 度
  露出計回路用スイッチと連動
- コマ数計 ---------- 自動復元順算式
- 巻きもどし---------- クランク式
- シンクロ接点--------- M および X 接点　自動切換
  1／125秒以下の低速においてスピードライトに同調
- アクセサリーシュー-----フラッシュ接点付（ホットシュー）
- 露出計
  フイルム面の中央部（12 mm 円内）に届く光の強さを測りシャッターおよび絞りに両連動する定点式 CdS露出計（TTL方式）、定点の合致は ファインダー内およびボデー上部より見える。
  フイルム感度範囲 － ASA 12～1600
  連動範囲 －F1.4 レンズ使用で ASA100にセットした場合
  絞りf／1.4秒から絞りf／11で1／1000秒まで
  銀電池－ 1.5 V 1個使用　EVEREADY　S－76
- 寸　法 ---------- 148 × 96 × 54 mm（ボデーのみ）
- 重　量 ---------- 780g（ボデーのみ）

4. Note

a. The numbers with the symbol ◎ in Fig.2 — Fig.33 represent the parts exclusively used for FT2 produced by the order since 31F3B-41.

b. The parts used commonly for Nikkormat FTN are noted with "FTN" in the column "Remarks" of the Parts List.

c. The serial numbers of FT2 are indicated as 5xxxxxx.

d. The following parts are exclusively used for FT2.
1-5, 15-2, 19-1, 21, 33-1, 211, 213-1, 214-2, 215-1, 216-1, 217-1, 309-1, 310-2, 355, 402-1, 458-2, 489-1, 459-2, 460-1, 551-2, 552-2, 554-1, 555-1, 556-1, 562-1, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, T607-1, T608-1, T609-1, T610-1, T611-1, T612-1, T613-1, T617-1, T847, T848, 717-1, 823, 833, 834, 856-1, 861, 862, 865, 902-1, 903-1, 906-1, 909-2, 910-1, 911-1, 920-1, 931-2, 934-1, 942-1, 944, 945, 980-1, 1001-1

e. The number and page enclosed by ⇨ represent corresponding No. of section and page of Assembling Points.

4. 注 意 事 項

a. Fig2 ～ Fig33 の中の◎のついた番号は FT2の専用部品で、オーダー41からのものです。

b. ニコマートFT$_N$ と共通のものは部品表の備考欄にFTN・記入してあります。

c. FT2の製造ナンバーは 5××××××です。

d. FT2の専用部品

1-5, 15-2, 19-1, 71, 33-1, 211, 213-1, 214-2, 215-1, 216-1, 217-1, 309-1, 310-2, 355, 402-1, 458-2, 489-1, 459-2, 460-1, 551-2, 552-2 554-1, 555-1, 556-1, 562-1, 564, 565, 566, 567, 568, 569, 570, 571 572, 573, 574, 575, 576, T607-1, T608-1, T609-1, T610-1, T611-1 T612-1, T613-1, T617-1, T847, T848, 717-1, 823, 833, 834, 856-1 861, 862, 865, 902-1, 903-1, 906-1, 909-2, 910-1, 911-1, 920-1 931-2, 934-1, 942-1, 944, 945, 980-1, 1001-1

e. 図中の

は組立要点のナンバーとページ数を表わす。

Nikkormat FT2

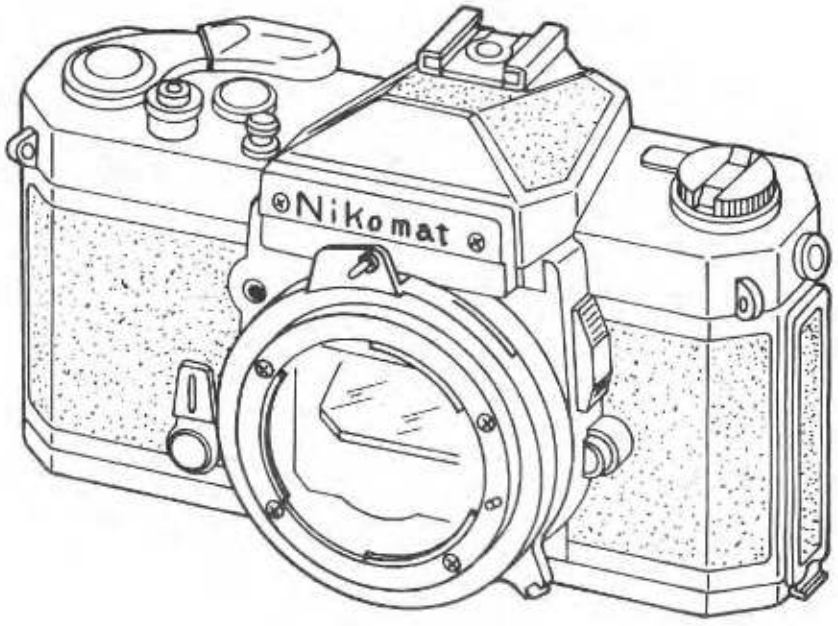


Fig. 1

Top plate
軍 艦

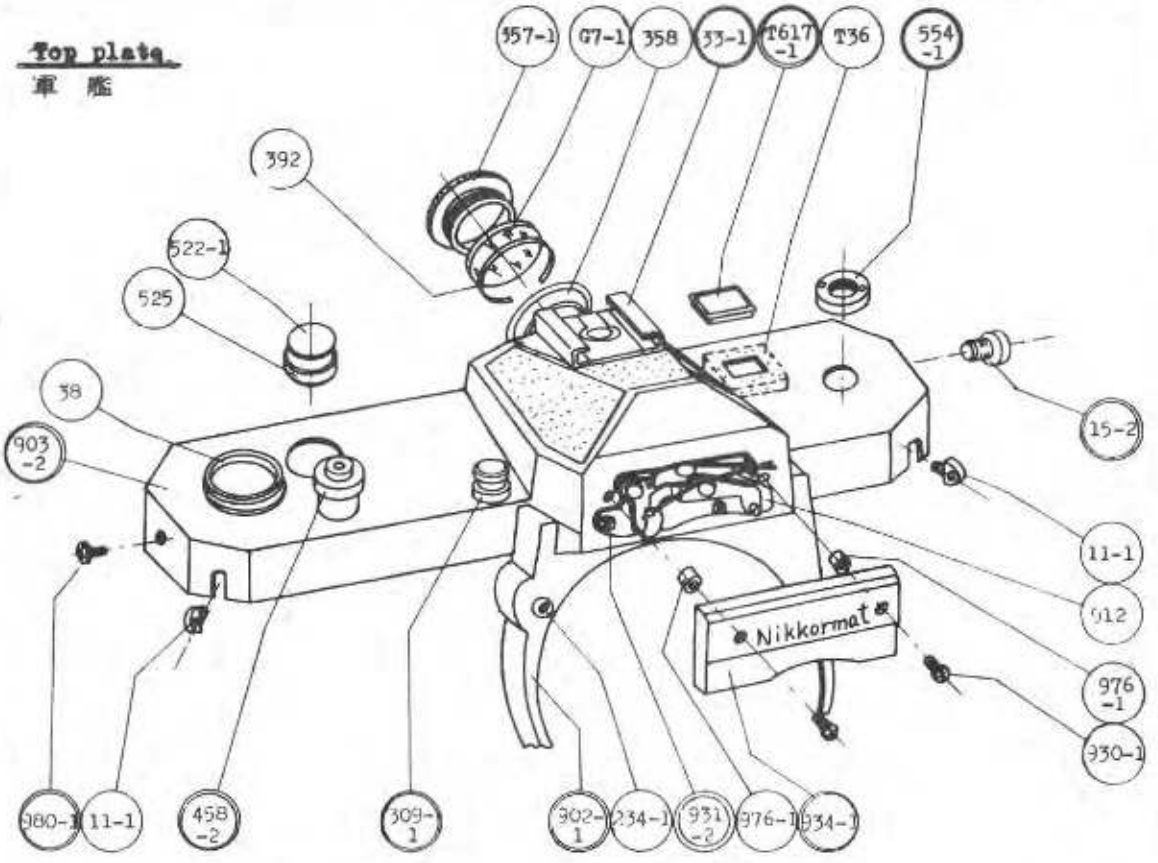


Fig. 2

Releasing mechanism
解 除 機 構

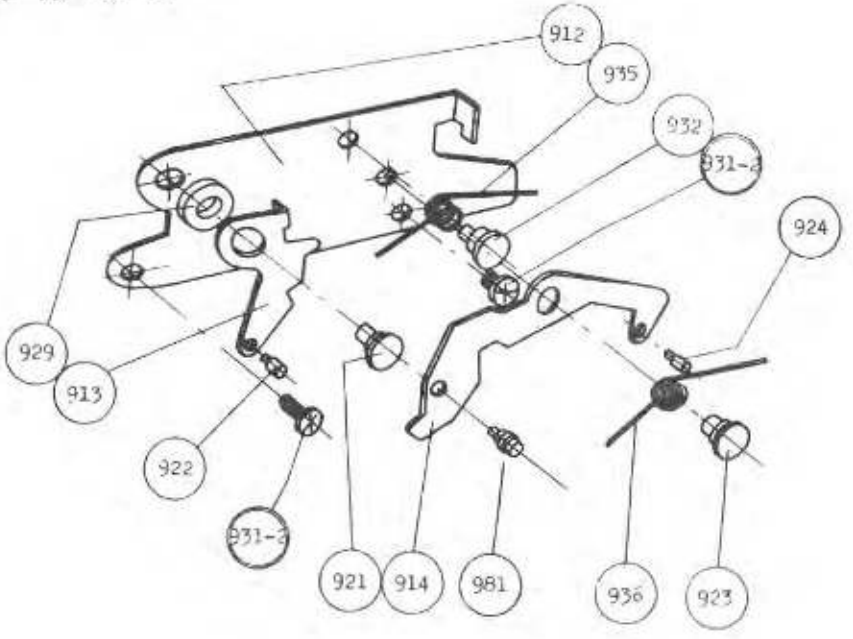


Fig. 3

Release button and manual aperture button
レリーズボタン，手動絞り込みボタン

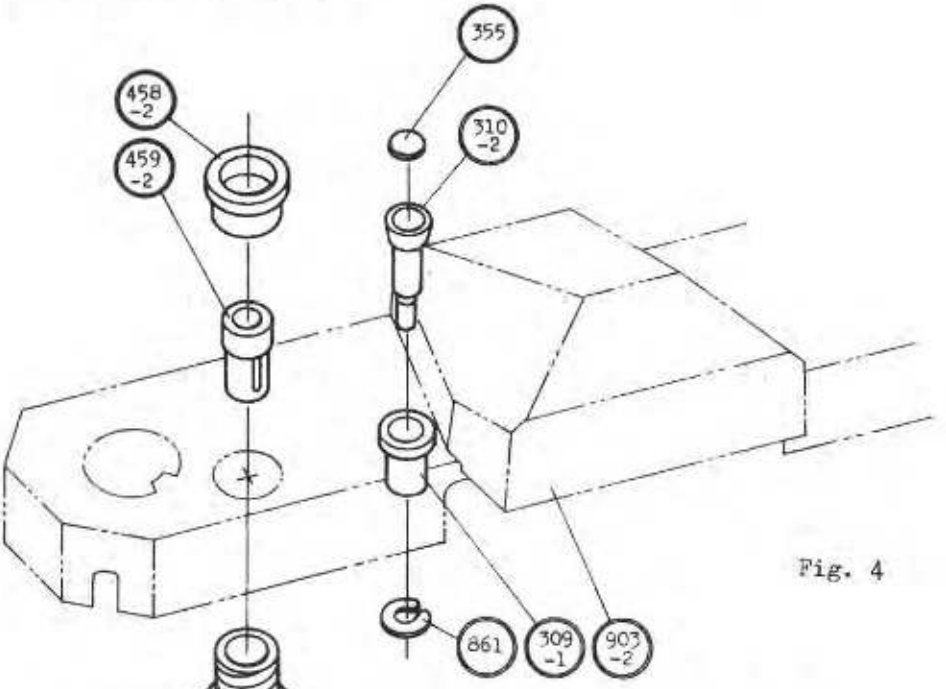
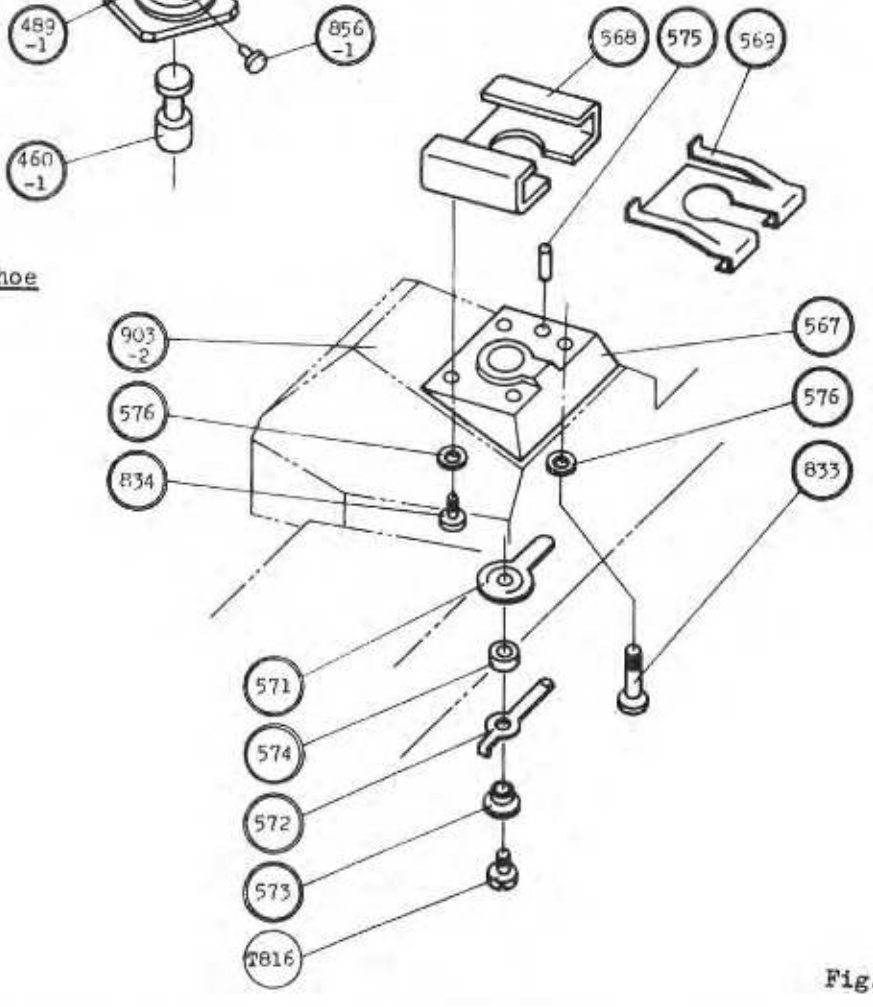


Fig. 4



Accessory shoe
ホットシュー

Fig. 5

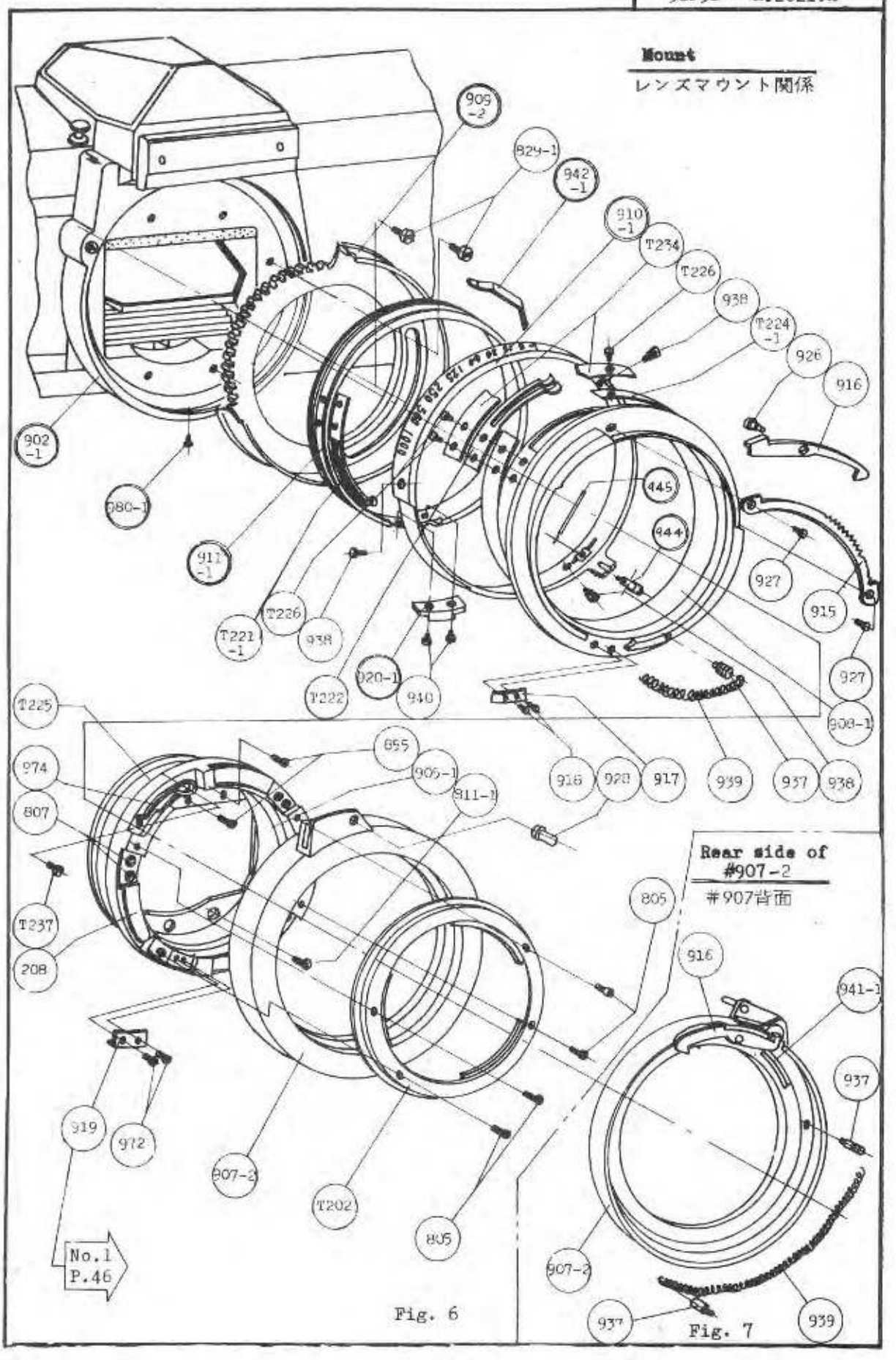

Mount
レンズマウント関係
909 -2
829-1
942 -1
910 -1
T234
T226
938
T224 -1
926
916
902 -1
880-1
911 -1
445
944
927
915
T226
T221 -1
938
920-1
T222
940
927
908-1
T225
974
807
T237
208
855
905-1
811-1
916
928
917
939
937
938
805
Rear side of #907-2
#907背面
916
941-1
937
907-2
939
937
919
972
907-2
T202
805
No.1 P.46

Fig. 6

Fig. 7

Attaching the shutter
シャッター取付

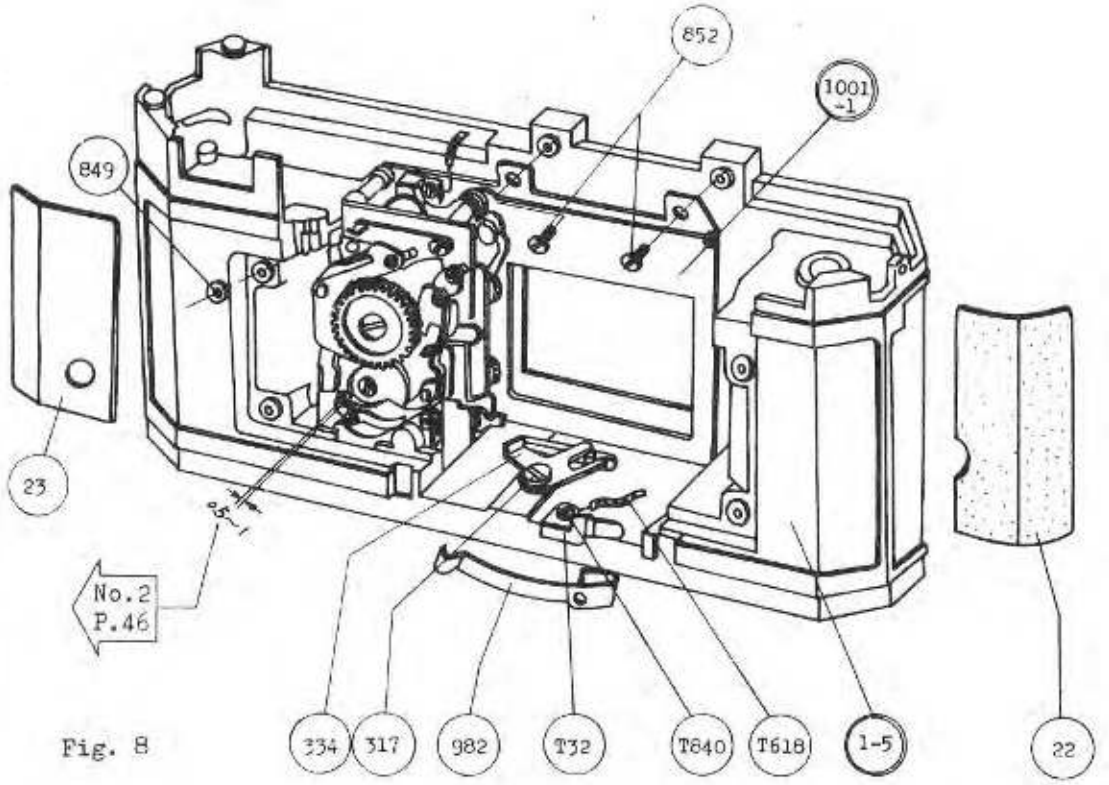
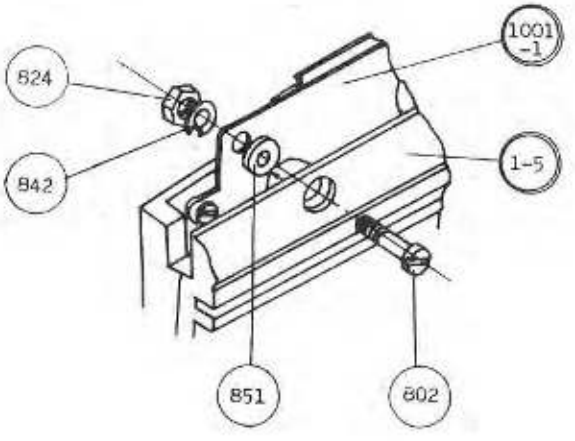


Fig. 8



How to attach the shutter to the the bottom surface of body
ボデー下面部シャッター取付状態

Fig. 9

Lefthand side plate of mirror box
ミラーボックス左側面

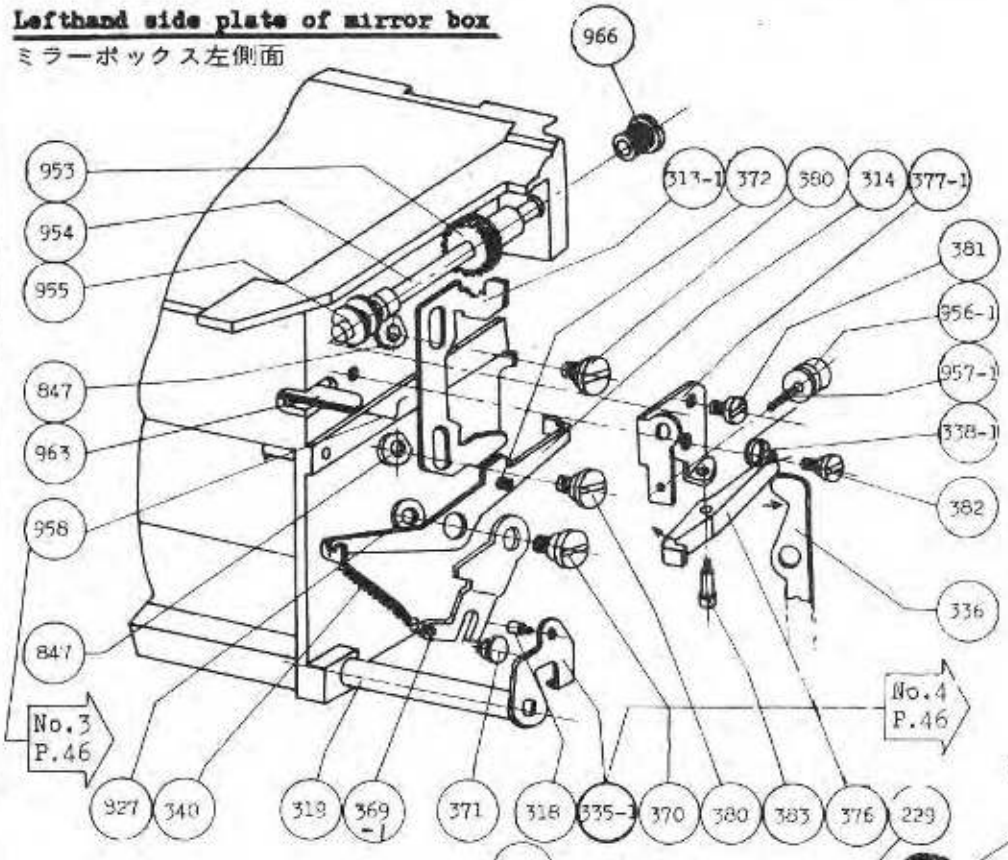
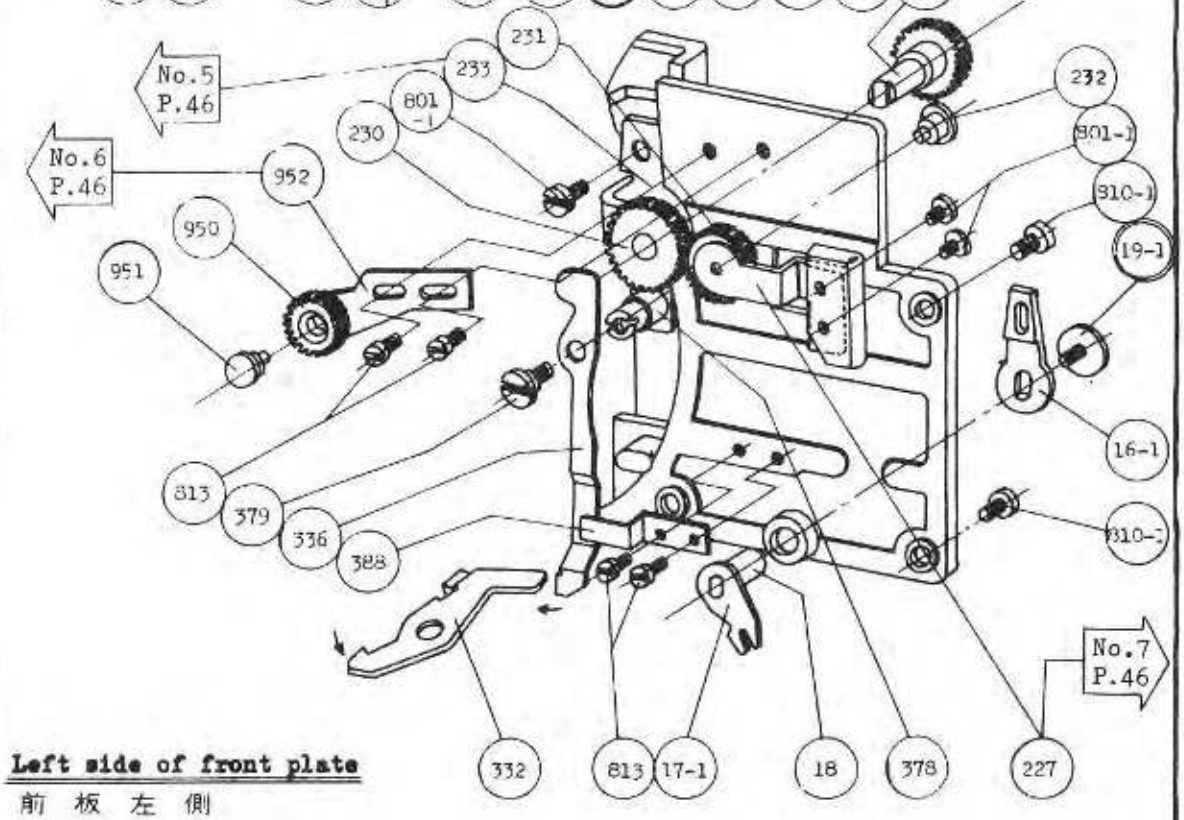


Fig. 10



Left side of front plate
前 板 左 側

Fig. 11

Mirror box, penta-prism

ミラーボックスペンタプリズム部

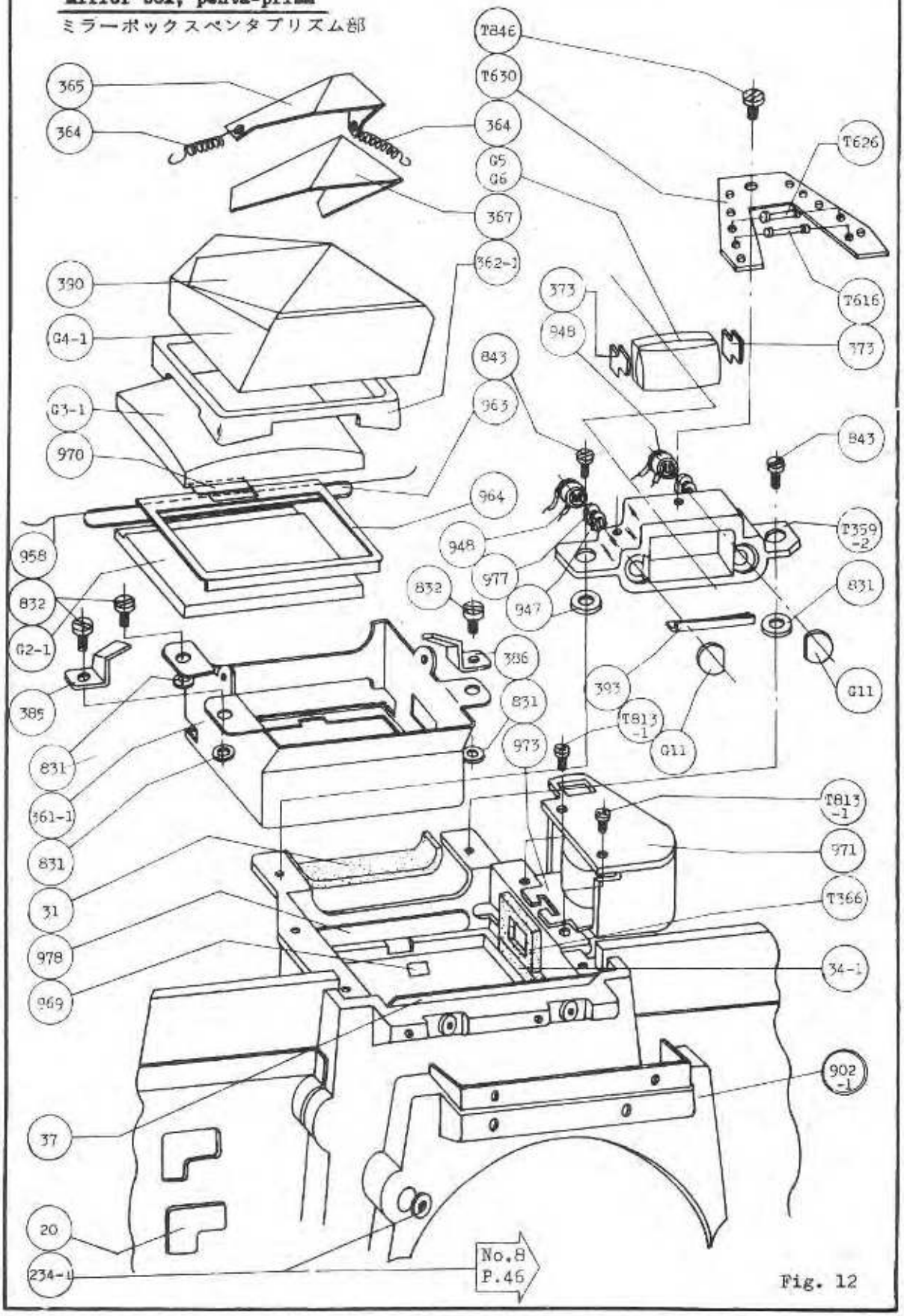


Fig. 12

Right side of mirror box
ミラーボックス右側面

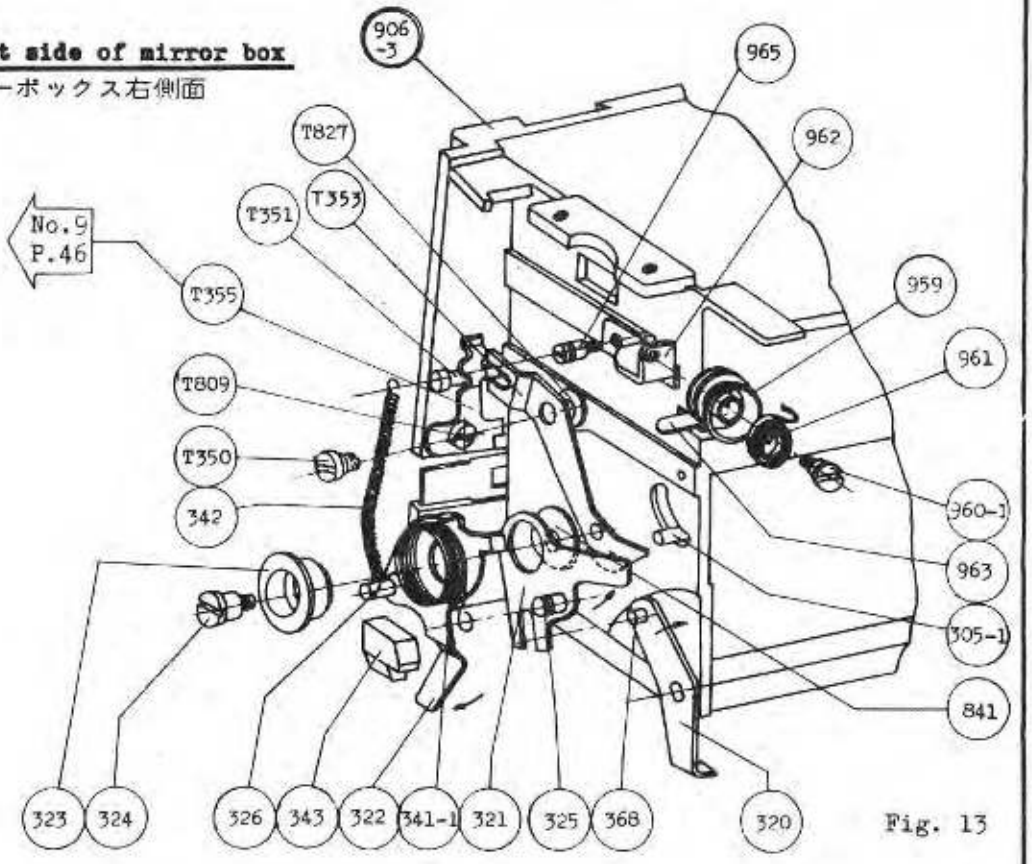


Fig. 13

Lens lock button and mirror-up button
レンズ着脱ボタンミラーアップ

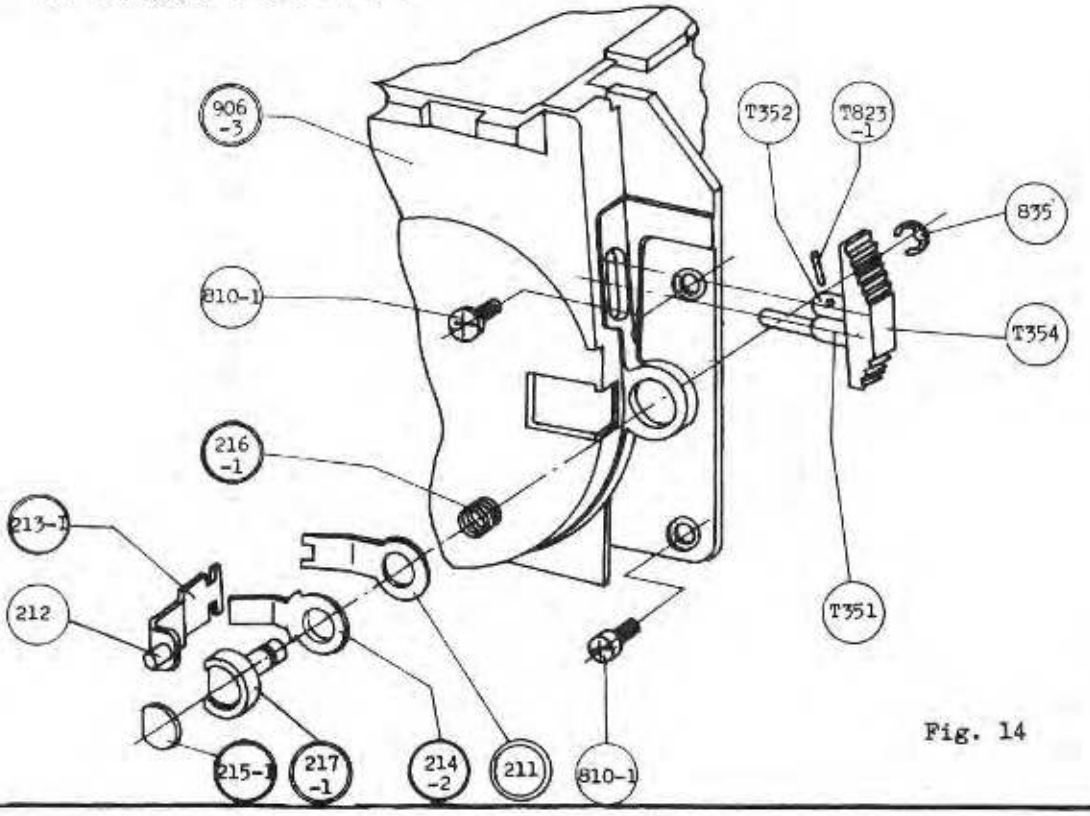


Fig. 14

Bottom surface of mirror box
ミラーボックス底面

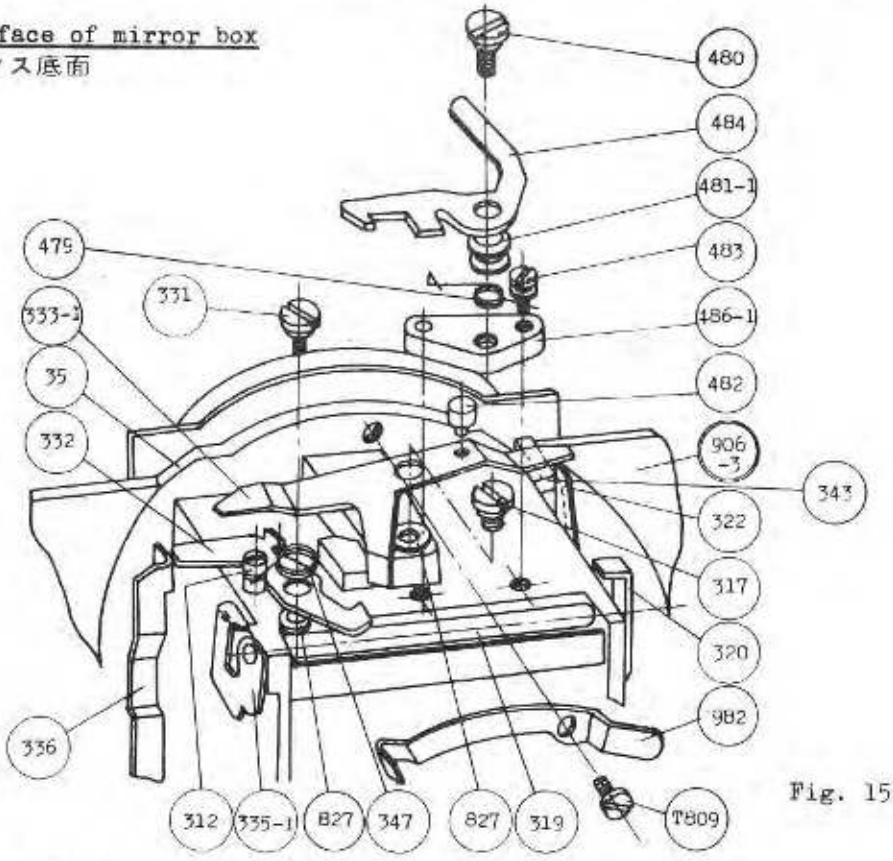


Fig. 15

Interior of mirror box
ミラーボックス内部

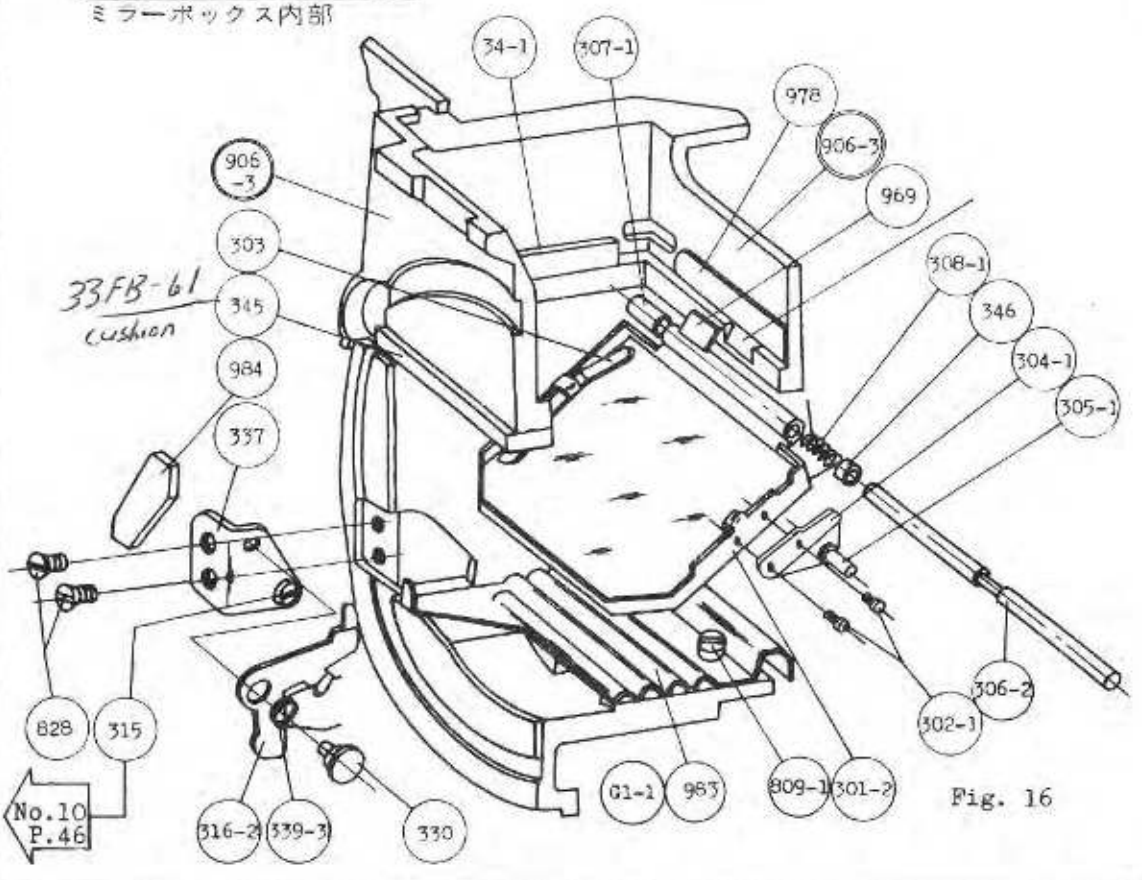


Fig. 16

Rewind knob and synchro soket

巻戻しノブ，シンクロソケット

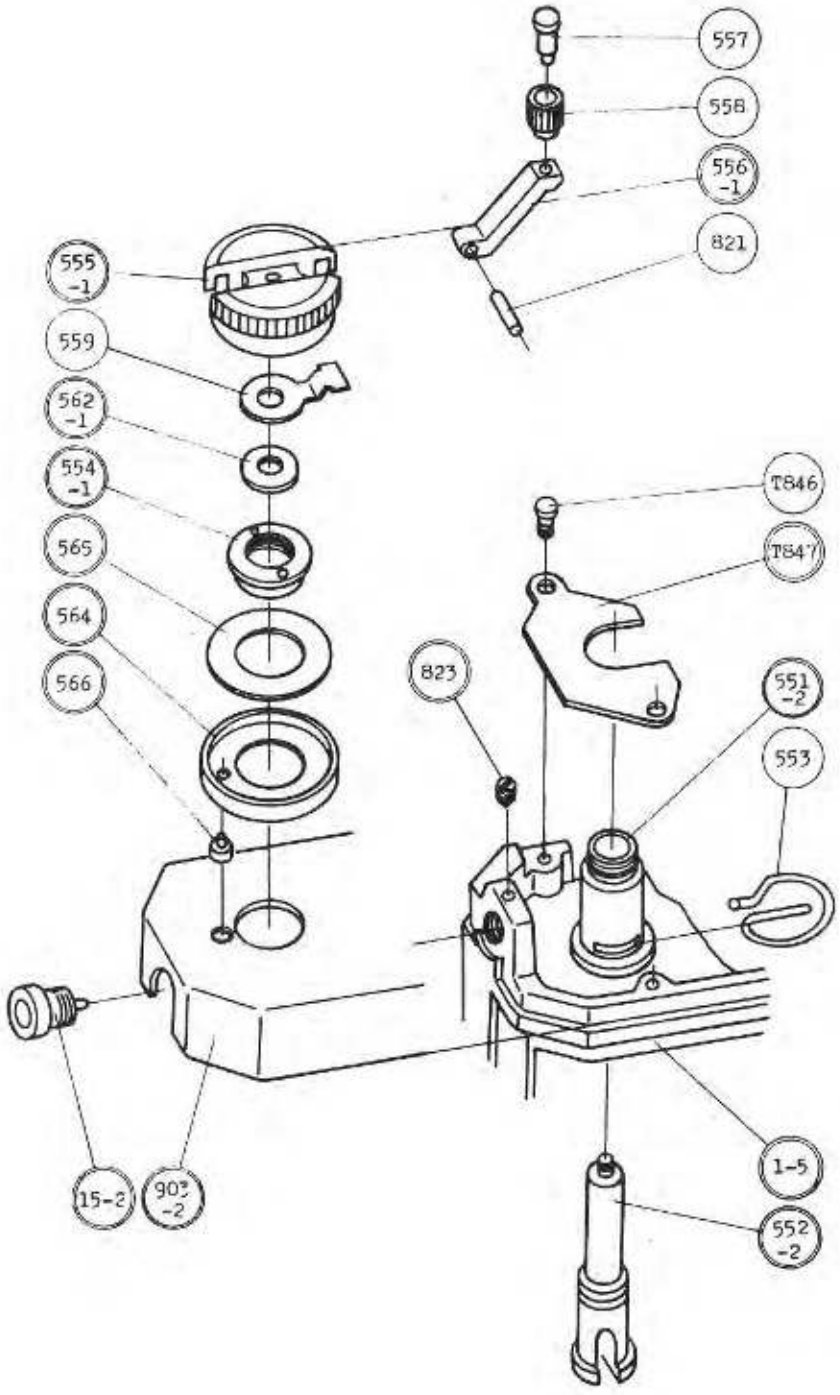


Fig. 17

Winding axle and exposure meter switch
巻上軸及び露出計スイッチ

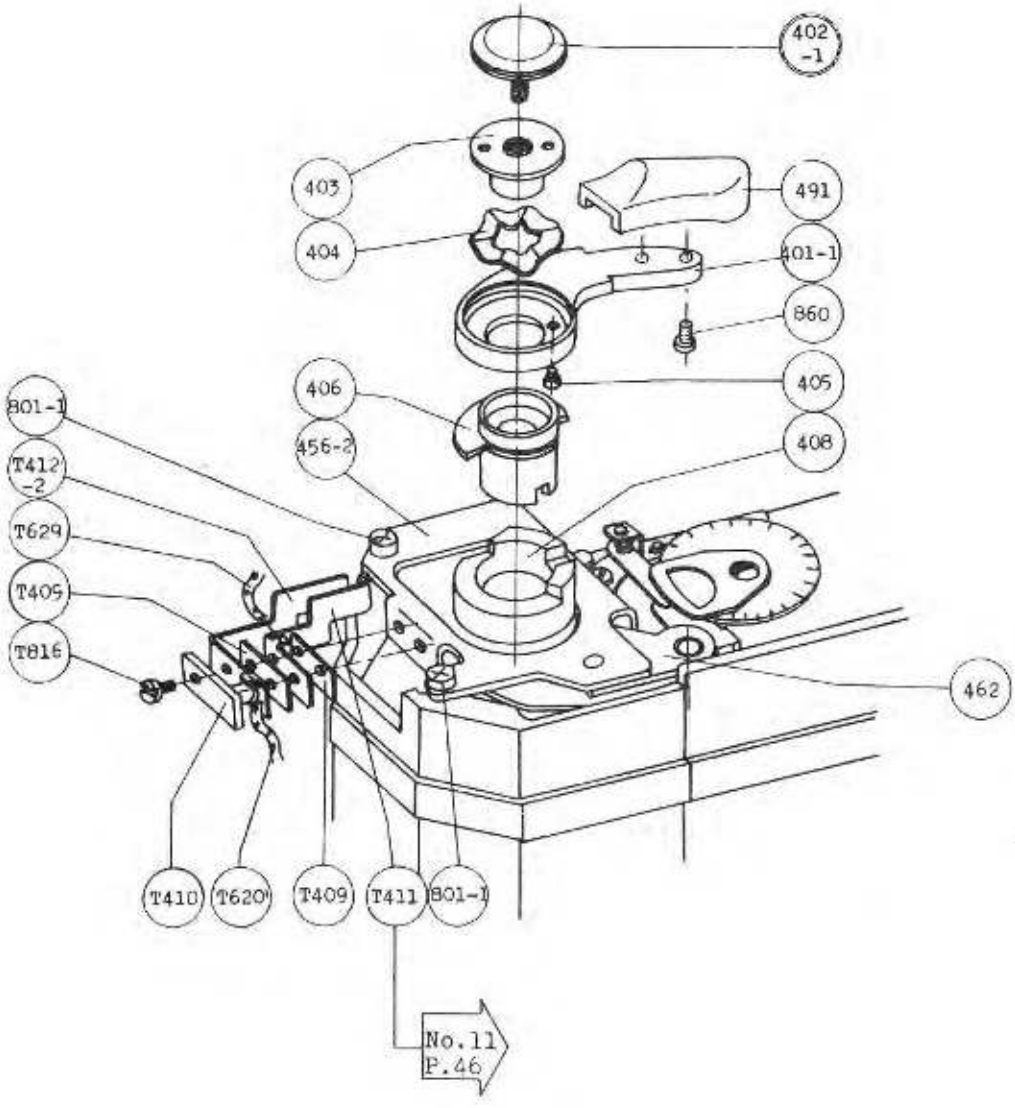


Fig.18

Film counter
枚数計

No.12 P.46

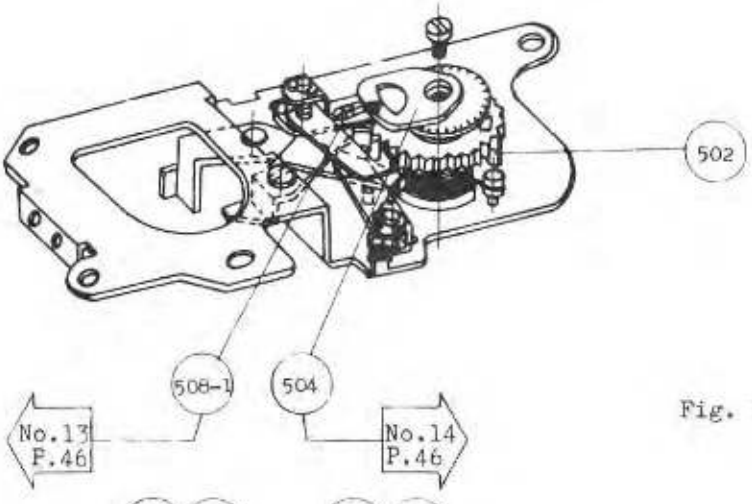


Fig. 19

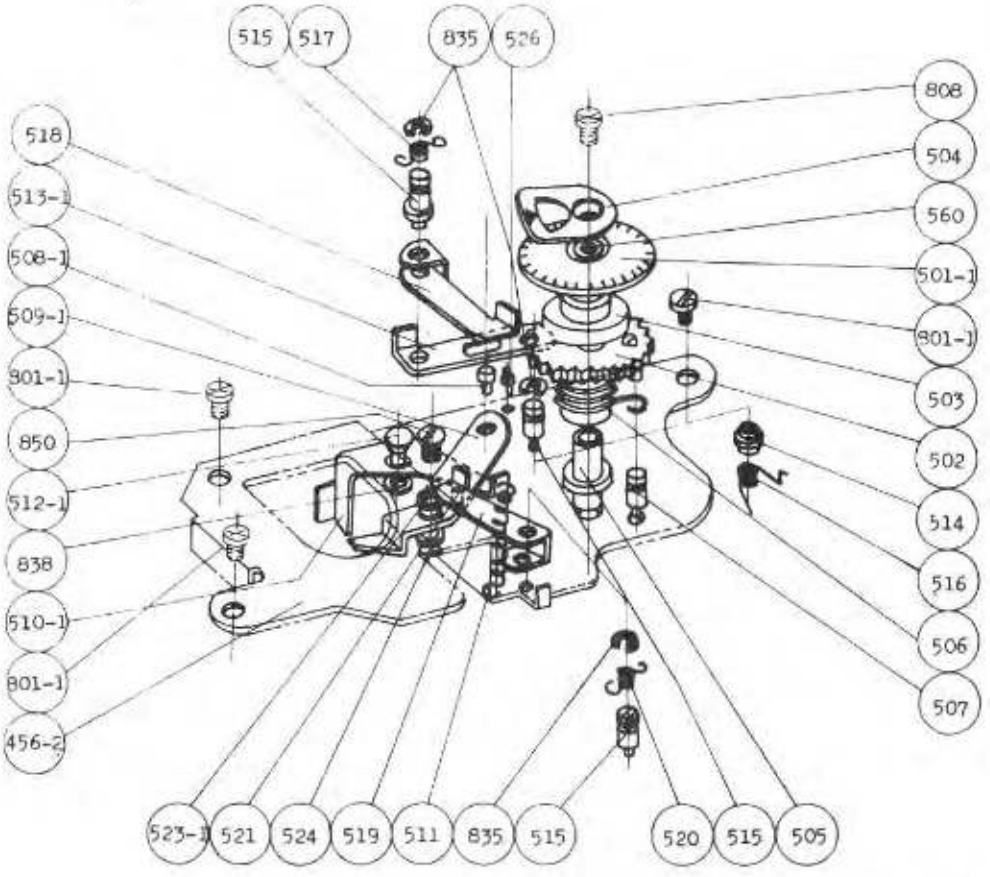


Fig. 20

Push button shaft and sac-saw lever
押ボタン軸及びシーソーレバー

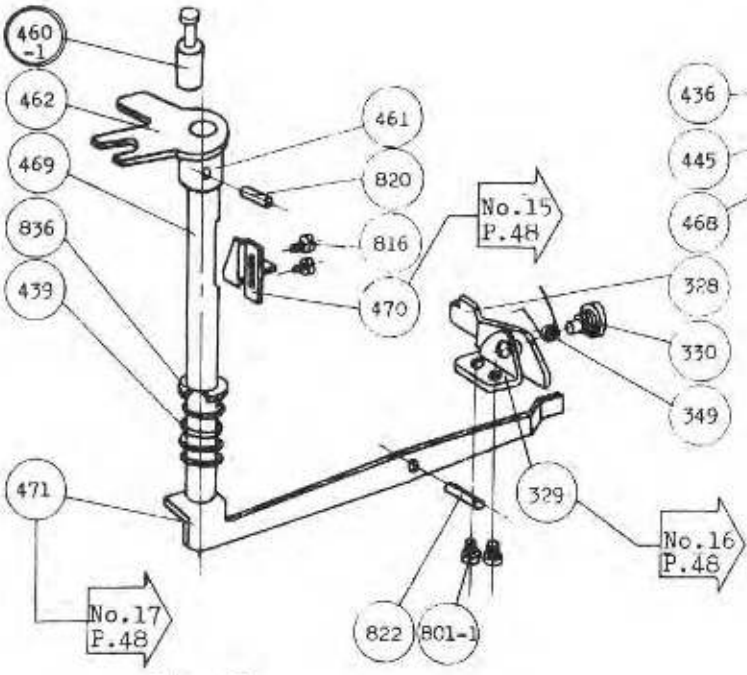


Fig. 21

Sprocket shaft
スプロケット軸

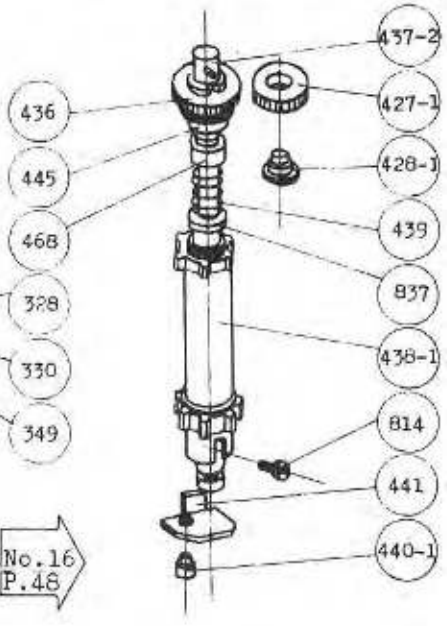


Fig. 22

Lower part of winding shaft
巻上軸下部

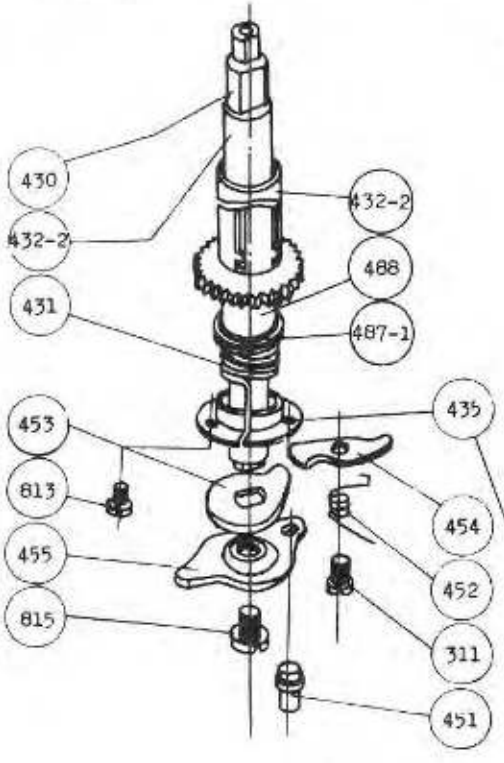


Fig. 23

Rack plate and tripod socket
ラック板及び三脚座

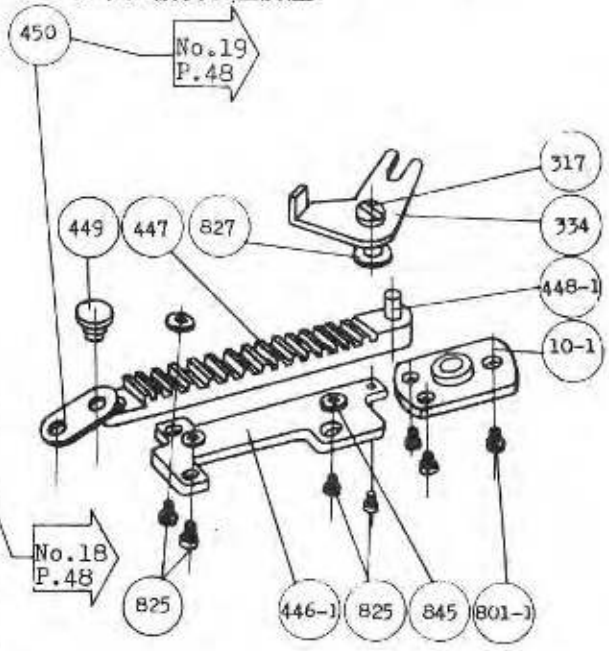


Fig. 24

Take-up shaft and safety device

巻上軸及び安全装置

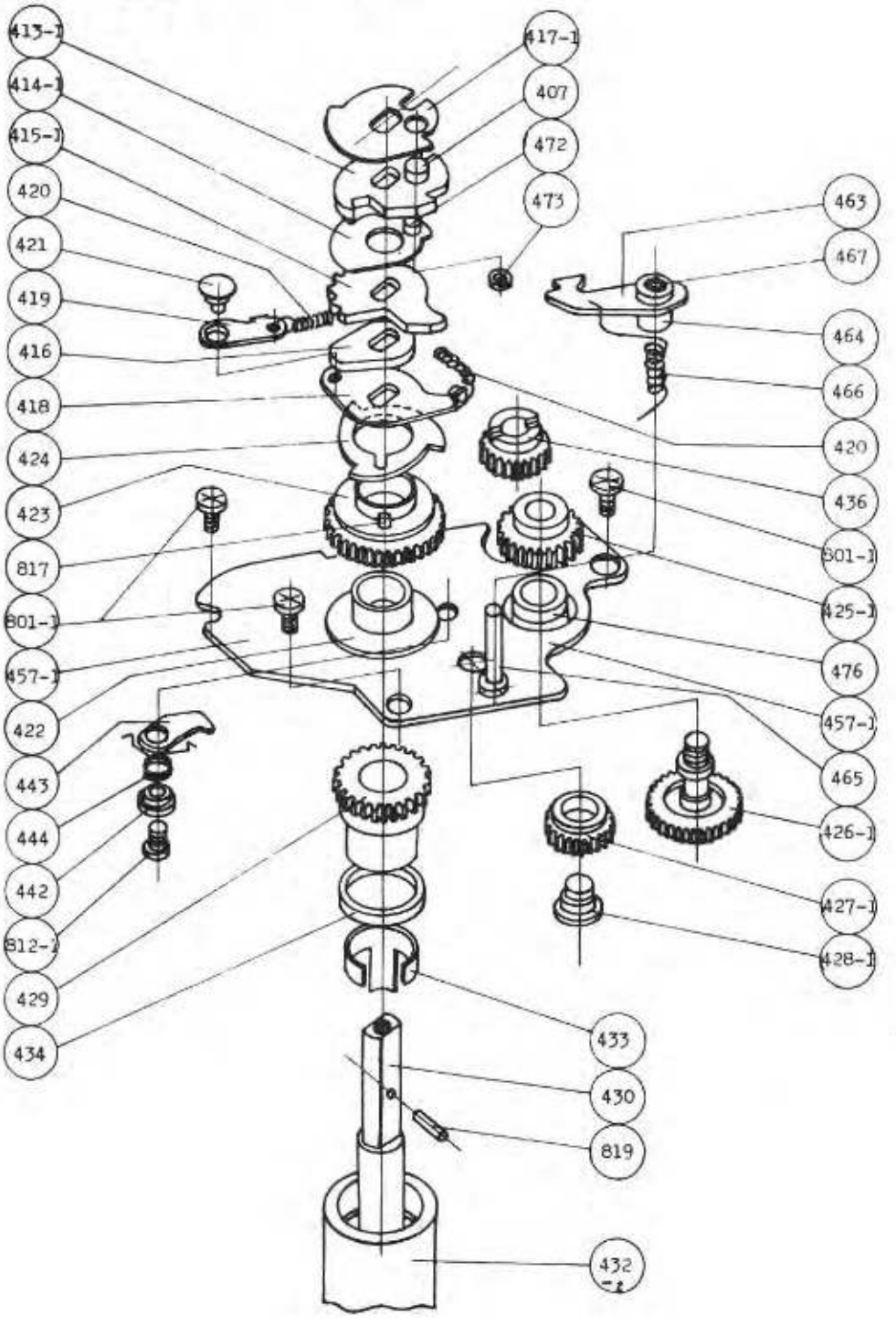


Fig. 25

Battery case
電池ケース

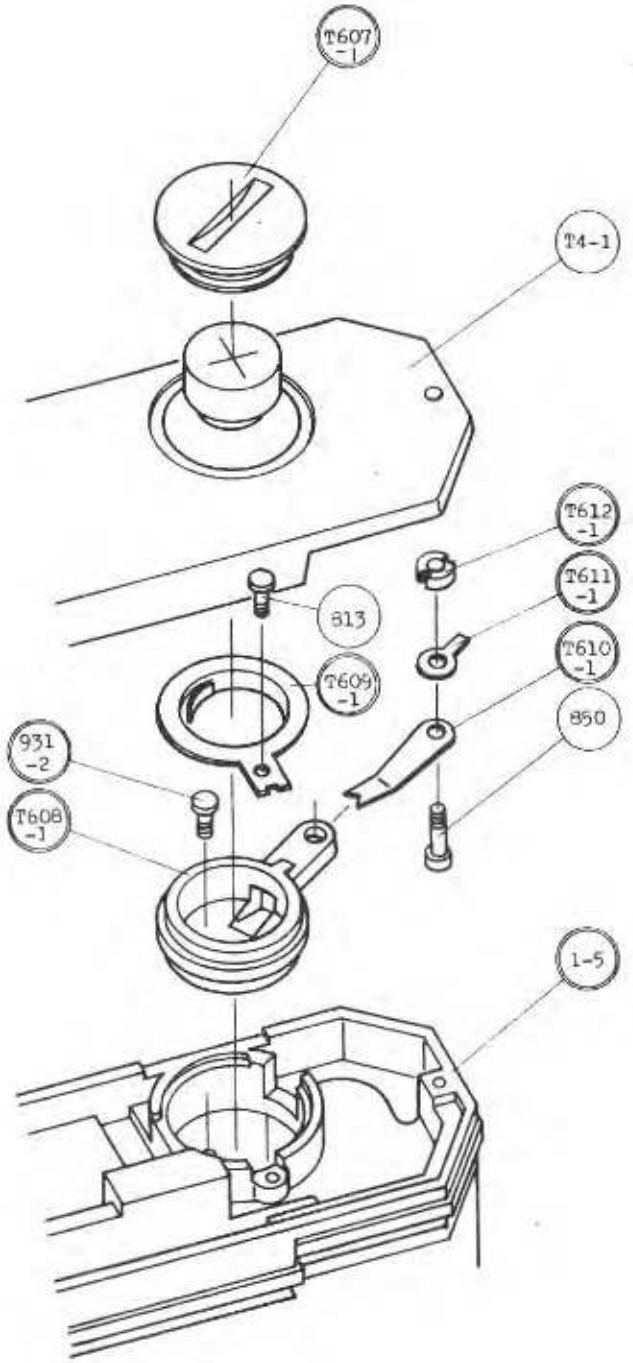


Fig. 26

Camera bottom
カメラ底部

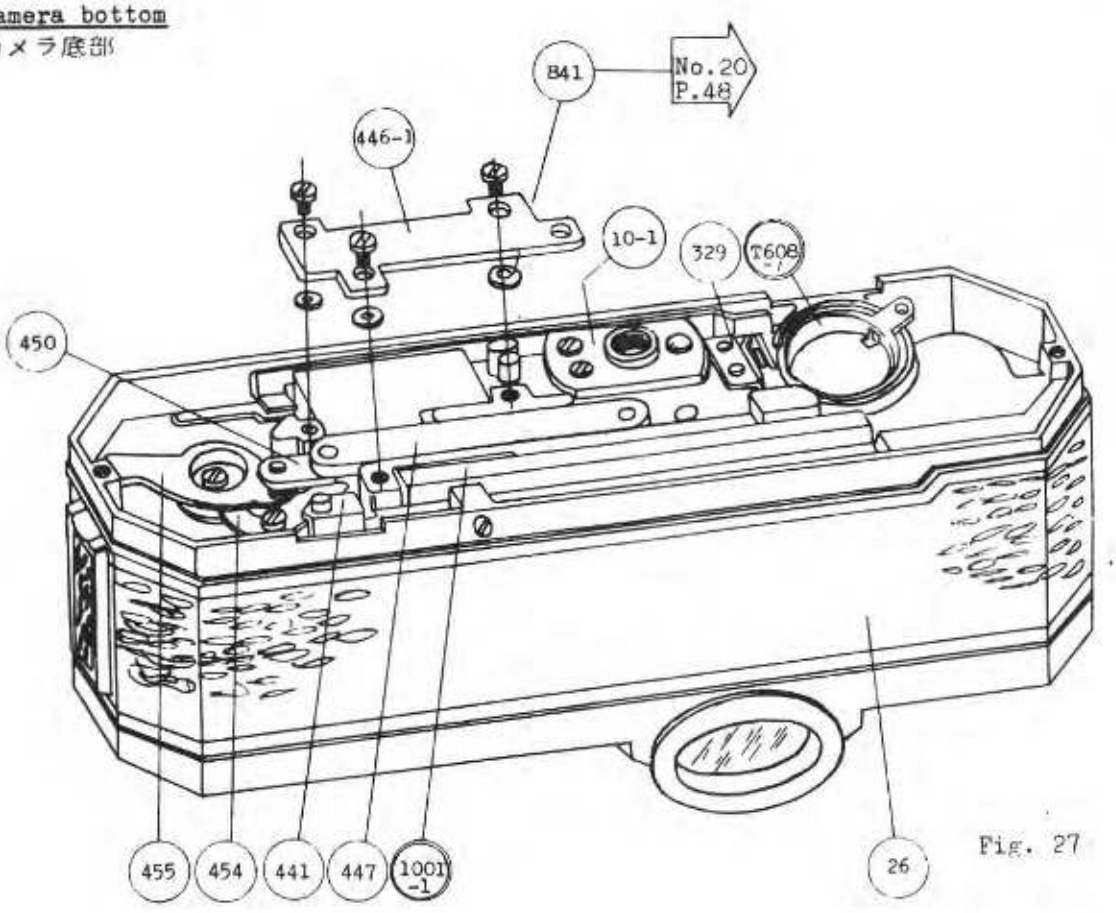


Fig. 27

Latch
留金具部

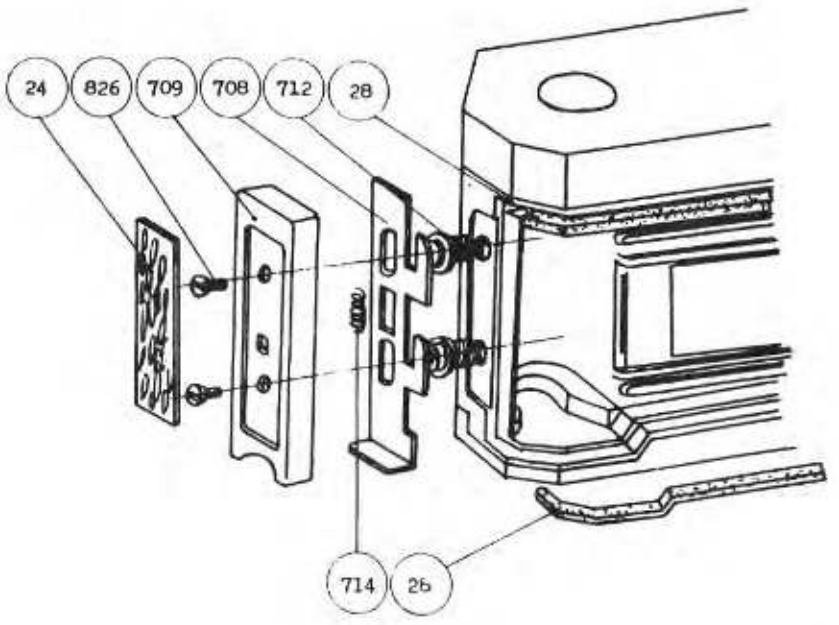


Fig. 28

Hinge
蝶 番 部

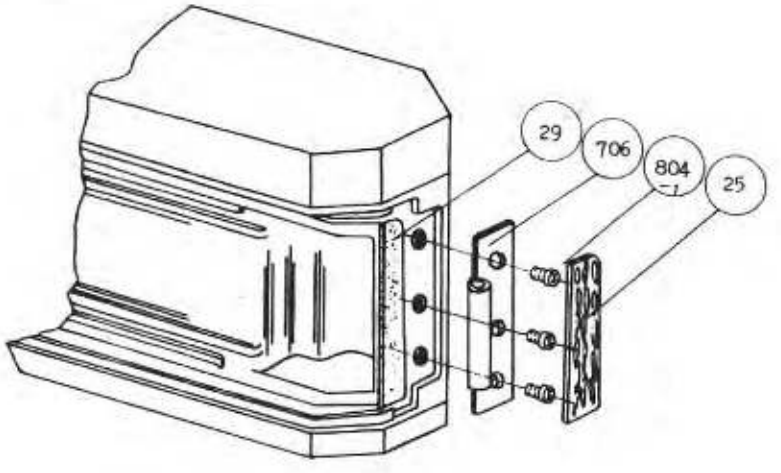


Fig. 29

Back cover, hinge

裏ぶた蝶番部

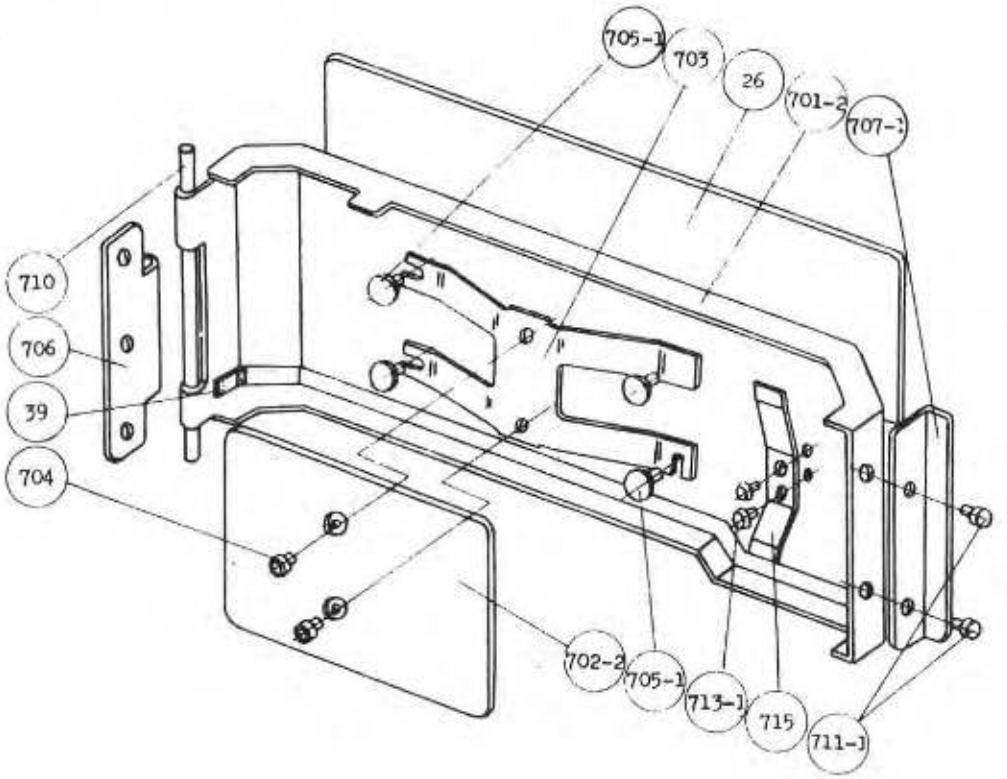
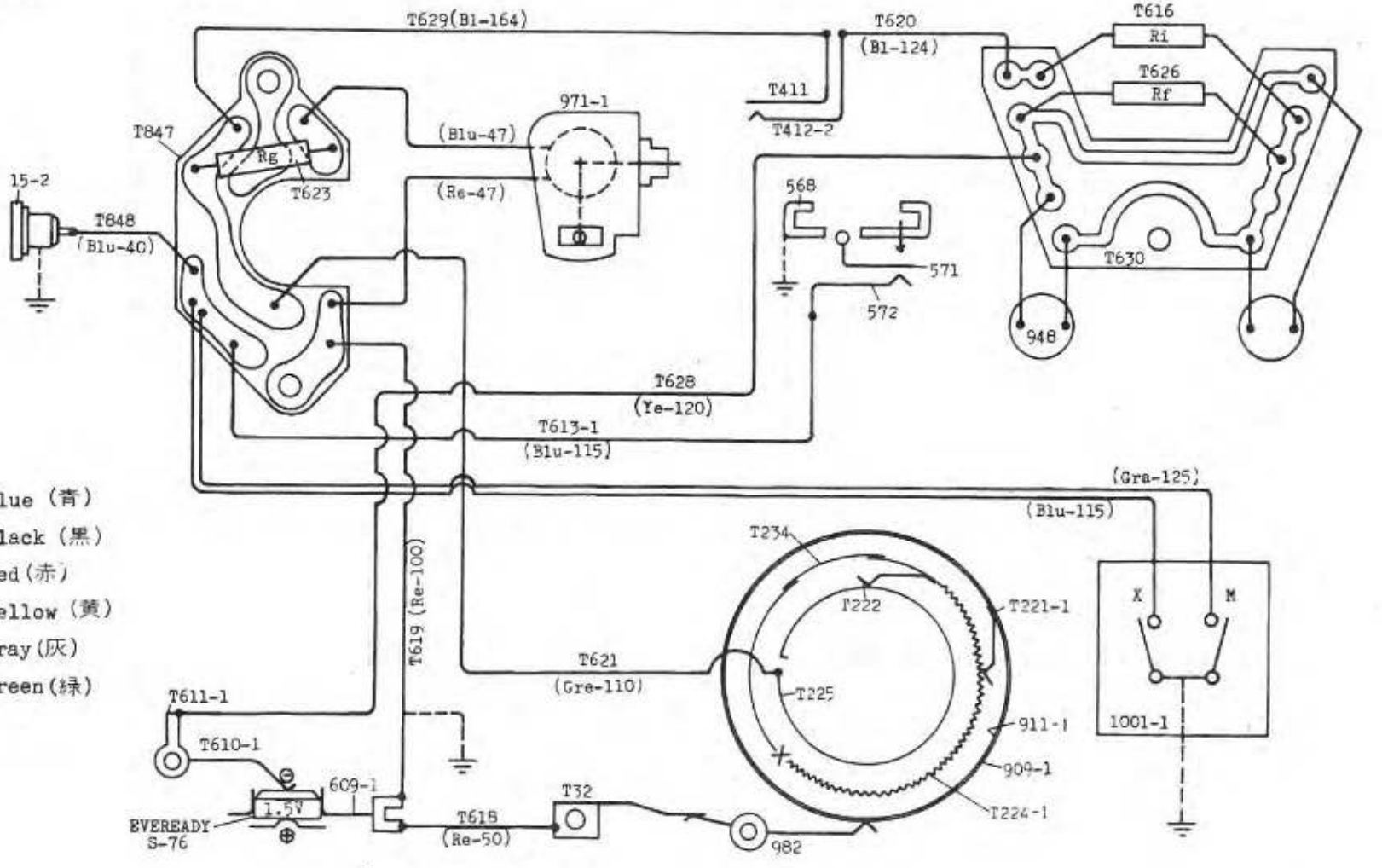


Fig. 30

6 Schematic view of wiring
実体配線図



Blu : Blue (青)
Bl : Black (黒)
Re : Red (赤)
Ye : Yellow (黄)
Gra : Gray (灰)
Gre : Green (緑)

Fig. 31

7. Nikkormat FT2 Exposure Meter

§ 1. STANDARDS OF MAIN PARTS

A) Resistance Characteristics of CdS Photo. Conductor #948

A - 1 Illumination - Resistance characteristics

	2 cd/m²	64 cd/m²	4096 cd/m²
Resistance	75.0 - 54.5KΩ	7.25 - 5.25KΩ	0.570 - 0.435KΩ

B) Variable Resistor T224

EV	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Upper Limit	KΩ ∞	KΩ 13	KΩ 5.0	KΩ 2.35	KΩ 1.25	Ω 740	Ω 445	Ω 275	Ω 170	Ω 108	Ω 71	Ω 47	Ω 32.5	Ω 22.5	Ω 16.2
Lower Limit	20	6.4	2.8	1.48	Ω 865	525	315	200	124	80	53.5	36	24.5	17.5	13

C) Meter #971-1

Current when the needle comes to the center	$14.2^{+2}_{-2}\mu A$
Swing angle	$10^{\circ}\pm1^{\circ}$
Internal resistance	about 3 KΩ
Torque	0.23mg - cm/deg. or higher

D) Fixed resistor

Rs	T616	40, 50, 60, 70, 100, 30, 80, 90Ω
Rf	T626	350, 400, 450Ω
Rg	T623	1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6KΩ

7. ニコマートFT2露出計修理指針

§1 主要部品規格

(A) CdS 光導電体抵抗特性 #948

A－1 照度－抵抗特性（標準規格）

	2 cd/m	64 cd/m	409 cd/m
抵抗値	KΩ 7.0 ～ 11.5	KΩ 1.25 ～ 3.25	KΩ 0.577 ～ 0.143

(B) 可変抵抗体 T224

EV	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
上限	KΩ ∞	KΩ 13	KΩ 5.0	KΩ 2.35	KΩ 1.25	Ω 740	Ω 445	Ω 275	Ω 170	Ω 108	Ω 71	Ω 47	Ω 32.5	Ω 22.5	Ω 14.2
下限	KΩ 20	6.4	2.8	1.48	Ω 865	525	315	200	124	80	53.5	36	24.5	17.5	13

(C) メーター #971-1

定点電流　14.2±3μA

振れ角　10±1°

内部抵抗　約3KΩ

トルク　0.23mg-cm/deg. 以上

(D) 固定抵抗器

R_1 T616　40, 50, 60, 70, 100, 30, 80, 90Ω

Rf T626　350, 400, 450KΩ

R_g T623　1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6KΩ

§2. TROUBLE CHART

Trouble	Cause	Checking	Remedy
Pointer needle does not move.	1. Batteries are not correctly deposited.	Open the battery chamber for checking	Make correction.
	2. Drain on the batteries.	Check for correct voltage of batteries.	Replace the batteries.
	3. Disconnection. (Not correctly soldered)	Check the circuit using the tester.	Make connection. Replace the disconnected part.
	4. Contact on the batteries or switch is not good.	Check for correct functioning of #T608-1 and #T610-1. Check for sufficient conductivity of switch, using the tester.	Clean the contact. Replace the part. Correct the bending of the contact or replace it.
	5. Short-circuit	Check the circuit, using the tester.	Replace or insulate the short-circuited part.
	6. Moving part of meter is seized.	Meter needle does not move even when blown, or it stops at an indefinite position.	Remove dust. Replace the meter.
	7. Moving part of meter is seized, when the meter is fitted to the camera.	The needle does not move, although it move correctly in the meter before assembly.	Clean or replace the mirror housing window, condenser, pentaprism or meter

§2. 指度不良品の修理

故障状態	原　因	故障判別	修理方法
指針振れず	1.電池入れ忘れ及び土逆	電池室を開けて確認	電池を正常に入れる
	2.電池劣化	電圧のチエックを行なう	電池交換
	3.断　線 半田付不良	テスターによる回路のチエック	・断線部の接続 ・断線部品の交換
	4.接触不良 (電池及びスイッチ)	T609－1，T610－1の目視確認 テスターによるスイッチ導通のチエック	・接触部の清掃 ・部品交換 ・接触片を曲げ修正又は交換
	5.ショート	テスターによる回路のチエック	・ショート部品の交換 ・ショート部の絶縁
	6.メーター単体可動部の引掛り	メーターを吹いても振れぬまたは不特定位置でとまる	・ゴミの除去 ・メーター交換
	7.メーター可動部の引掛り	単体では動き良好なるも組むと引掛る	・ミラーボックス窓，コンデンサー，ベンタ清掃又はメーター交換

Trouble	Cause	Checking	Remedy
Unsteadiness of pointer needle indication.	1. Disconnection (not always)	Check the circuit, using the tester.	Make connection. Replace the disconnected part.
	2. Incorrect contact of variable resiator. (not always)	Check for correct pressure of contact brush. The variable resistor is worn out.	Adjust the contact brush. Replace the part.
	of switch	Check for sufficient conductivity.	Correct the bending of the contact or replace it.
	of battery chamber	Check for correct functioning of #T609-1 and #T610-1.	Cleaning, correct bending or replacement.
	3. Short-circiut.	Check the circuit, using the tester.	Insulate or replace the short-circuited part.
	4. Moveing part of meter is seized.		Remove dust. Replace the meter.
	5. Inadequate friction of meter needle.	The position of needle when set at EV11 differs too much from that obtained after the meter is once faced toward a brightness of EV-15 and then returned to EV11.	Replace the meter.
	6. Excessive slack of shutter dial.	Remarkable movement of needle within the range of the slack.	Adjust #227.
	7. Unbalnce of meter needle.	Indication changes over 0.3mm at the end of needle, according to the posture of the meter	Replace the meter.

故障状態	原　因	故障判別	修理方法
指針指示不安定	1.断線（時々）	テスターによる回路のチェック	・断線部の接続 ・断線部品の交換
	2.接触不良（時々） 可変抵抗体	ブラシ接触圧確認 可変抵抗体磨耗大	・接触圧調整 ・部品交換
	スイッチ	導通のチェック	接触片を曲げ修正又は交換
	電池室	T609－1，T610－1の確認	清掃，曲げ修正，交換
	3.ショート	テスターによる回路チェック	ショート部絶縁又は交換
	4.メーター可動部の引掛り		・ゴミの除去 ・メーター交換
	5.メーター摩擦不良	BV11でメーターの指針を定点に合わせた時とその状態でBV15の輝度面に当てBV11の輝度面に戻した時とで指針位置が目立つて異なる	メーター交換
	6.シャンターダイアルスラック大	スラック巾での針の動きが特に目立つ	⌀227　調整
	7.メーター平衡不良	姿勢によつて指示差が出る（先端0.3ミリ以上）	メーター交換

Trouble	Cause	Checking	Remedy
Too much difference between the indications by internal and external pointer needles.		With the internal needle coincided with the index, see if the external one come to touch the index circle with no clearance on one side.	Replace the meter.
Incorrect zero-position of pointer needle.		Even when switched off, the needle does not go out of the frame.	Replace the meter.
Even with the cap put on, the needle moves.		Set the needle to EV-3, put on the cap and switch on. The needle swings close up to the index.	Replace Rf. Choose a resistance high enough to get the needles within ±1/2 step.
Pointer needle is swung out.	1. The needle is adhered.	The needle moves normally when subjected to vibration.	Replace the meter.
	2. Insufficient conductivity of the shunt circuit.	Check for correct contact of #T222.	Replace the part.
	3. Short-circuit on the printed wiring plate.	Check short-circuit on the lead wire, resistor and soldering point.	Insulate the short-circuited part.

故障状態	原　因	故障判断	修理方法
メーター内外指針接触		内指針を指標に合わせたとき、外指針と円弧指標の間に隙間がない	メーター交換
メーター0位置不良		スイッチoffにしても指針が枠外に出ない（目ざわりである）	メーター交換
キャップをしても針が振れる		EV3にセットしてキャップをかぶせてスイッチonにすると針が定点近くまで振れる	RT 交換 ±1／2段に入る範囲で出来るだけ抵抗値の高いものを使う
指針振り切れ	1.指針吸着	振動を加えると正常に動く	メーター交換
	2.分流回路導通不良	T222接触状態確認	部品交換
	3.プリント板上でショート	リード線，抵抗器，ハンダのショート目視	ショート部分を断つ

Trouble	Cause	Checking	Remedy
Inaccuracy of indication.	1. Drain of batteries.	Insufficient swing of needle on the whole range. Check the voltage.	Replace the batteries.
	2. Aging or the like of CdS, variable resistor meter, or fixed resistor.	Although the movement needle is normal, high accuracy is not obtained. Check every part individually.	Replace the part below standards.
Loosening of ASA ring lock.	#944 wear down.	ASA ring moves unintensionally.	Replace the part.

故障状態	原因	故障判別	修理方法
精度不良	1電池劣下	全体に振れ不足 電圧チェックする	電池交換
	2 d S 可変抵抗体 メーター 固定抵抗器の経時変化等	動きは正常であるが精度が出ていない 各部品単位でチェック	規格外部品の交換
クランプ不良	#944のセリ	ASAツマミ，不要意に動く	部品交換

§3. DISASSEMBLING PROCEDURE OF THE EXPOSURE METER

1) Release #402-1, using a piece of rubber sheet to remove #403, #404 and #401-1. (Use the screw driver J11020)

Thereafter, remove #555-1 as well as #554-1 and #930-1.

(Use the screw driver J11022)

Taking care of the synchro cord, push up the top plate of the camera gently and unsolder the parts.

2) Meter

Remove #T847, draw out #951-1. (Use the screw driver J11021)

Unscrew #T813-1 (meter setting screws)

Put it out carefully, taking care of the meter pointer needle and of the index.

3) Switch

Remove #T816.

4) Printed circuit.

Remove #T846.

5) Variable resistor

Unscrew four screws #811-1.

Holding #910-1 (shutter ring), remove #213-1 and #211, to detach the whole bayonet part. Then, remove #910-1, #907-2 and #908-1 from the bayonet in this order.

Note 1. When detaching the bayonet part from the front plate, take caution not to disconnect #T621 (green colored cord).

Note 2. For removing #908-1, draw it out after bringing #T222 (brush) up to the position of the notch on the #905-1.

6) CdS cells

Unsolder the printed circuit.

To remove the CdS cells, take them out by flange of the sealed case, using the end of a screw driver.

§3. 露出計分解手順

1) #402-1をゴムでゆるめ、#403，#404，#401-1まで取りはずす。（J11020使用）

次に#555-1をはずし、#554-1，#930-15はずす。（J11022使用）

シンクロコードに注意しながら静かに軍艦を押し上げ、半田付各部をバラす。

2) メーター

#T847を外し#551-2（J11021使用）をぬきとる。

#T813-1（メーターホルダ）をはずし、メーター指針及び指標に注意しながら静かに横にぬく。

3) スイッチ

#T810にずす。

4) プリント板

#T846にずす。

5) 可変抵抗体

#811-1 4本ぬく。

#910-1（シャッタリング）を持って#213-1と#211をはずしながらバヨネット部全体をはずす。次にバヨネット部より#910-1，#907-2，#908-1の順にはずす。

注1) 前板からバヨネット部をはずすとき#T621（緑コード）の断線に注意すること。

注2) #908-1をはずすときには#T222（ブラシ）を#905-1の切欠部位置まで持って来てからぬくこと。

6) CdS

プリント配線板の半田付をはずし、シールドケースのつばをドライバーの先で軽くこじるようにして引抜く。

§4. MEASUREMENT OF EACH PART OF METER

1) CdS cells

Disconnect all the wirings except for the CdS cells from the printed wiring plate. Take measurement of the parallel-connected resistance of the CdS cells. If the measuring result is not within the Standard §1.A-1, replace one or two of the cells.

For measurement, use the standard lens 50mm/1.4(JIS8011).

Note: The above measurement should not be affected by the brightness of the surroundings.

2) Variable resistor

Connect the ends of #Tu19 and #Tu21 to the tester to measure the resistance.

Replace the resistor which is remarkably out of the standard.

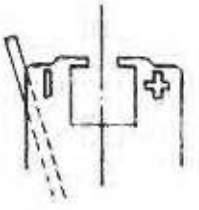
For the measurement, the slack of the shutter gear is to be adjusted to a minimum or to be brought to either side.

Use the standard lens 50mm/1.4(JIS8011) for the measurement.

3) Meter

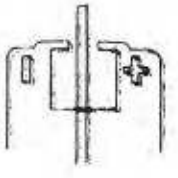
3)-1 Position of the zero point

The pointer needle should move beyond the negative (-) mark of the bracket.



3)-2 Displacement of the pointer needle

When the pointer needle in the finder is brought to the center, the top needle should have clearance on either side in the index ring (See Fig.).



4) Fixed resistor

Measure the resistance of each fixed resistor, using the tester.

§ 4. 部品の測定

1) CdS

プリント配線板からCdS以外の配線を取りはずし、CdSの並列抵抗値を測定する。

抵抗値が§ 1A- 1の規格にはいっていない場合は一方又は両方とも交換する。

注) 測定は周囲の明るさに影響されないよう留意すること。

測定工具はJ18011を使用すること。

2) 可変抵抗体

#T619, #T621の端をテスターに接続し抵抗値を測定する。

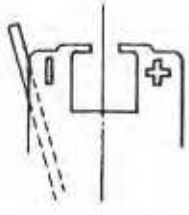
規格から著しくはずれているものは交換する。

測定に際してはシャッターギアースラックを最小に調整するか、又はどちらか一方に寄せて測定する。

測定工具はJ18011を使用すること。

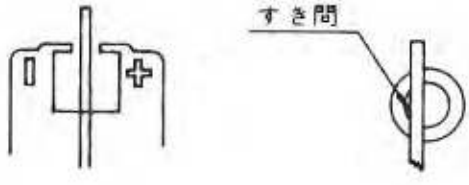
3) メーター

3) - 1 0点位置ー目視、指針が指標の (マイナス凸) 印抜部分より、外側に在ればよい。



3) - 2 指針差

ファインダー側指針を定点に合わせたとき、上部指針と指標円環との間にすき間が出来ていればよい。



4) 各固定抵抗

テスターを使用して抵抗値を測定する。

§5. ASSEMBLING OF THE EXPOSURE METER

1) Variable resistor

Reverse the disassembling procedures mentioned in §3 - 5), that is, fit #908-1, #907-2 and #910-1 to #905-1. Then, pass the green cord (#T621) through the hole in the front plate. Putting #213-1 into #211, gear up #909-1 with #229.

Note: Adjust the slack on the shutter dial by means of #227.

At the same time, assure the short-circuit between the positions EV-2 and EV-3, with a clearance made at either end of the resistor against both the stoppers at 8 and 1/1000 sec.

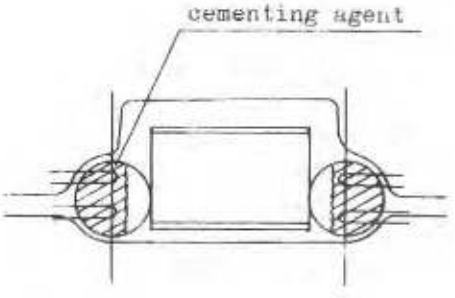
2) Meter

Set the mirror box in place, taking care of the pointer needle and the index.

Note: Viewing into the finder, fasten #T813-1 tightly, so that the index frame becomes parallel to the viewfield frame.

3) CdS cells

Put the CdS cells into #T359-2, with the side not coated with cementing agent faced inside, and at the same time attach the two lead wires vertical at their base, with lacquer.



4) Printed wiring plate

Do not fasten #T846 too firmly.

§5. 組　立

1) 可変抵抗体

§3.分解手順　5) との逆の要領で#908-1，#907-2，#910-1，#905-1に組む。次に#T621（緑コード）を前板孔に通し#213-1を#211に入れながら#909-1と#299をかみあわせる。

注）#227でシャッターダイアルのスラックを調整する。

同時にB側及び $\frac{1}{10000}$ 側共余裕を持たせ、EV2-3間のショート，絶縁を確認する。

2) メーター

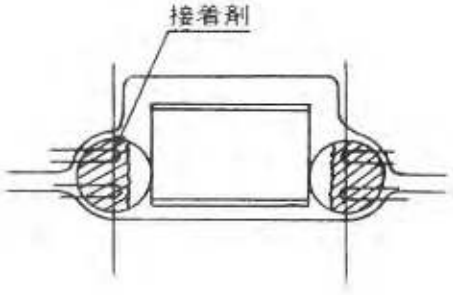
指針及び指標に充分注意しながらミラーボックスにはめ込む。

注）ファインダーを視ながら指標ワクを視野ワクと平行にして#T813-1をしめる。

3) CdS

#T359-2にCdSを入れる。

図のように接着剤のついていない方を内側にし、二本のリード線の根本が垂直になるようにし、ラックで止める。



4) プリント配線板

#T846強くしめ過ぎないこと。

§6. ADJUSTMENT OF THE EXPOSURE METER

In principle, the exposure meter is to be adjusted by means of the fixed resistors R1(T616), Rf(T626) and RG(T623) , and not by means of adjustment of the filter on the CdS or that of the sensitivity of the meter. However, if need arises, the filter #977 for the Photomic-T can be used.

Replacement and readjustment are also carried out in the following way.

First, make temporary wiring.

It will be convenient to begin with

R1 = 50Ω, Rf = 2KΩ and RG = 5KΩ, although any of R1 and of Rf within the range (see P.) can be taken.

1) Facing the meter toward the brightness EV11, adjust the RG until the pointer needle comes to the center.
2) Facing the meter toward the brightness EV15, observe the accuracy. If the indication remains within ±1/2 step (in terms of the aperture of the lens), leave it. If the needle swings too much, increase R1. If the swing is not sufficient, decrease R1. However, it is desirable that R1 be as large as possible within the range of 1/2 step.
3) Facing the meter toward the brightness EV6, observe the accuracy. If the indication is within ±1/2 step, leave it. Too large swing needs the increase of R1 and conversely, too little swing requires the reduction of Rf. It is desirable that the swing be as large as possible within the range of ±1/2 step.

Note: In adjustment, take care to prevent the brightness of the surroundings from affecting the CdS.

§6. 露出計調整

露出計は原則として固定抵抗器RI（T616），Rf（T626），RG（T623）によって調整するものとし、CdSのフイルター調整、メーターの感度調整は行なわないこと。ただし、やむを得ない場合に限り#977を使用する。

部品交換及び単なる再調整も下記手順により行なう。

先ず仮配線をする。

RI，Rfは適当でよいが　RI＝50Ω，　Rf＝∞KΩ　，　RG＝3KΩ　から始める。

1）EV11の測光箱輝度面に当てRGを調整して指針を定点に合わせる。

2）EV15の測光箱輝度面に当てて精度を視る。±1／2段（レンズ絞りて）以内であればそのままでよい。振れすぎの場合はRIを大きくする。逆に振れ不足の場合にはRIを小さくするがRIは±1／2段範囲内で大きい方が望ましい。

3）EV6の測光箱輝度面に当てて精度を視る。±1／2段以内であればそのままでよい。振れ過ぎの場合はRfを大きくする。逆に振れ不足の場合小さくするが±1／2段の範囲内で大きい方が望ましい。

注）調整の際、周囲の明るさがCdSに影響を与えないよう留意すること。

8. Assembling points

No.	Points
1	Make adjustment by selecting the best from six ones of different sizes. (designed value $\theta = 6^{\circ}\,30'$) Use the cementing agent "Locktight B".
2	Make adjustment by changing the engagement of rack. Be carefull with the relation to double exposure prevention pawl.
3	To be cemented after being wounded around #955.
4	Change bending for adjustment of time-lags of shutter releasing, mirror-up motion and aperture opening.
5	Adjust the engagement to #909-2.
6	Adjust the engagement to #953.
7	Adjust speed control gear on the shutter side and #230.
8	To be cemented after correctly positioned for #910-1 shutter speed scale.
9	Perform adjustment and fitting so as to prevent opening, after making mirror-up.
10	Eccenter pin for adjusting 45° angle of the mirror is to be cemented with lacquer after correct positioning.
11	Change bending to adjust On-Off operation of switch according to the positions of the red dot on the top plate and of the winding lever.
12	Adjustment proceeds as follows; Advance the scale to 10 - 20 after being assembled. In this position, be sure of engagement of stopper pawl #519 to the ratchet. Ser index plate #504 to the scale. Then, adjust the advancement by means of eccenter pin #508-1. Open the camera back. Return the counter to zero. In this position, if any displacement is found between S and the index, make adjustment by bending the stopper part of the ratchet #502.
13	Eccenter pin for adjusting counter advancement. (After adjusted, cement with lacquer.)
14	Turn this to adjust the asvancement on the way.

8. 組 立 要 点

No.	組 立 要 点
1	寸度の異なる6種を適当に換えて調整のこと (設計値 θ=6°30′) ロックタイトB使用のこと
2	ラックのかみ合わせで調整。二重防止つめとの関係注意
3	#955に巻付後 接着
4	シャッターレリース、ミラーアップ及絞りとのタイミングの調整は曲げて行う。
5	#909-2 (Aギヤ) とのかみ合いを調整
6	#953 (目盛ギヤ) とのかみ合いを調整
7	シャッター側調速ギヤと#230 (Cギヤ) とを調整
8	#910-1 シャッター目盛に合わせて貼付
9	ミラーをアップさせ 口が開かないように調整取付
10	ミラー45°出し調整用偏芯ピン、位置出し後ラック止め
11	軍艦赤丸指標とまき上レバーの位置によるスイッチのON及OFFの調整 (曲げて行う)
12	枚数計の調整はボデーに組込んだ状態において目盛を10~20くらいまで送る。その状態で止めつめ519がラチェットに掛っているのを確認してから目盛に指標板504を合せる。次に偏芯ピン508-1により送り量を調整する。以上が終ってからボデーの裏フタを開け零に戻し、この時Sと指標のずれがあればラチェット502の制限部を曲げて調整する。
13	508-1 枚数計送り量調整偏芯ピン (調整後ラック止め)
14	504 目盛送り途中における位置調整 (回転させる)

No.	Points
15	Adjustment of B-lever: The lever is to operate simultaneously or up to 0.5mm before shutter releasing.
16	Move this back or foward, to maintain the height 3.1mm of the aperture lever before or after winding.
17	Change bending for shutter release adjustment. Releasing of safety device and the releasing position are to be adjusted so that shutter is released simultaneously or up to 0.3mm (in stroke) after the releasing.
18	Returning power of the winding lever is found too weak, displace it as far 120°.
19	Two types are provided for adjusting shutter charge. (In case of insufficient advancement, exchange it.)
20	Washer for adjusting the engagement between rack and pinion. (If unnecessary, remove it.)

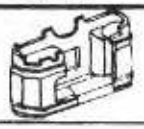
No.	組　立　要　点
15	Bレバーの調整、シャッターレリーズと同時又はそれ以前シャッターレリーズより 0.5 mm前までの範囲で作動するようにする。
16	絞りレバーの高さ3.1 mmのまき上げ前後によるズレの調整（前後にずらす）
17	シャッタレリーズの調整（曲げる）安全装置解除とレリーズ位置とは解除と同時かそれより0.3mm（ストローク）までの範囲でシャッターがレリーズするように調整する。
18	まき上げレバーの戻りが弱すぎる場合 120° ズラすことにより強くする。
19	二種類あり、シャッターのチャージ量調整に使用する。 (送りが不足の場合交換してみる事)
21	ラックとピニオンのかみ合わせを調整する。（不用の場合は使用せず）

PARTS LIST

部　品　表

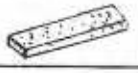
1. Parts List 部品表

31F3B - R.2021.A

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
1-5	**Body** ボデー 	1		9,8,17 26	×	~41
10-1	Tripod socket 三脚ねじ	1		24, 27	○	FTN
11-1	Eyelet ちり環	2	B23	2	△	FTN
15-1	Synchro terminal シンクロターミナル	2		2, 17 31	○	32FB #15 ~41
16-1	Self-timer lever セルフレバー	1	*T21-1	11	○△	FTN ~29 20001/ 40000 *Rev.
17-1	Self-timer coupling lever 連動レバー	1	C14-1	11	△	FTN
18	Self-timer lever shaft レバー軸	1	C14-1	11	△	FTN
19-1	**Self-timer lever screw** 飾ねじ	1	*T21-1	11	○△	32FB #17 ~41 *Rev.
20	Front plate hole cover 孔カバー	1		12	○	FTN
21	S cap Sキャップ	1			○	~41
*22-1	**Right front leather** 擬革	1		8	○	~41 *Rev.
23	**Left front leather** 擬革	1		8	○	FTN

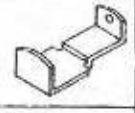
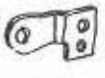
Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
24	Latch cover leather 擬革	1		28	○	FTN
25	Hinge side leather 擬革	1		29	○	FTN
26	Back cover leather 擬革	1	E1	27, 30	○ △	FTN
28	Body light tight sheet モルトプレン	2		28	○	FTN
29	Hinge light tight sheet モルトプレン	1		29	○	FTN
31	Eye guard light tight sheet モルトプレン 	1	* TNC15-1	12	○△	FTN *Rev.
* 33-2	Top cover leather ペンタ部擬革	1	T2A1	2	○ △	-45 20001 40000 *Rev.
34-1	Fresnel frame light tight sheet わくカバー	2	* T2C1-1	12,16	○△	FTN *Rev.
35	Front plate lower light tight sheet モルトプレン	1	* T2C1-1	15	○ △	FTN *Rev.
37	Front plate upper light tight sheet シャ光幕	1	* T2C1-1	12	○△	FTN *Rev.
38	Take-up shaft dust-tight ring リング	1	T2A1	2	△	FTN
39	Light tight sheet モルトプレン	2	E1	30	○ △	FTN

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
43	Eyelet bush つり環筒	2	B23		△	FTN
208	Bayonet spring バヨネットばね	3	TND5	6	○△	FTN
* 211-1	Lens lock lever spring 古はね	1	*T2C1-1 * C26 -1	14	○△	~42 *Rev.
212-1	Lens lock pin 着脱ピン	1	D7-2	14	△	~42
213-2	Lens lock lever レバー 	1	D7-2	14	△	~42
* 214-3	Lens lock lever coupling 舌板	1	*T2C1-1 *C26 -1	14	○△	~42 *Rev.
215-2	Lens lock axle M ボタン	1	*T2C1-1 * C26 -1	14	○△	~42 *Rev.
216-1	Lens lock button spring M はね d=0.4	1	* T2C1-1	14	○ △	~41 *Rev.
217-1	Lens lock button M 飾り	1	* T2C1-1	14	○△	~41 *Rev.
219	Button axle1 ボタン軸	1	*T2C1-1 *C26-1		○△	-42 *Rev.
227	D gear bearing ギア受板 	1	C13	11	△	FTN

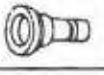
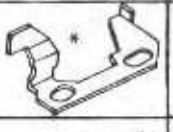
Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
229	Shutter B gear シャッターギヤB	1	C12	10	△	FTN
230	Shutter C gear シャッターギヤC	1	C12	11	△	FTN
231	Shutter D gear シャッターギヤD	1	C13	11	△	FTN
232	D gear axle ギヤ軸	1	C13	11	△	FTN
233	B, C gear bearing ギヤ軸受	1	C12	11	△	FTN
234-1	Shutter speed index 指標板	1	* T2C1-1	2,12	○△	FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
301-2	Mirror support ミラー受	1	C2-2	16	△	FTN
302-1	Pin seat rivet カシメピン	2	C2-2	16	△	FTN
303	Mirror pressure plate 押え板	1	* T2C1-1	16	○△	FTN *Rev.
304-1	Mirror support pin bearing ちり取ピン座	1	C2-2	16	△	FTN
305-1	Mirror support pin ピン	1	C2-2	13,16	△	FTN
306-2	Mirror shaft ミラー軸	1	* T2C1-1	16	○△	FTN *Rev.
*307	Mirror shaft collar (left side) カラー	1	* T2C1-1	16	○△	FTN *Rev.
308-1	Mirror spring スプリング d=0.35	1	* T2C1-1	16	○△	FTN *Rev.
309-1	Manual aperture button base 絞りボタン受	1	T2A1	2,4	△	~41
310-2	Manual aperture button axle 絞り込ボタン 	1	T2A1	4	○△	~41
311	A.R lever axle レバー軸	1		23	○	FTN
312	Spring retaining screw ばね掛け	1	*T2C1-1	15	○△	FTN *Rev.
*313-2	Manual aperture lever 自動絞りレバー 	1	* T2C1-1	10	○△	~46 *Rev.
*314-2	Aperture lever 絞りレバー	1	*C10-1	10	△	~46 *Rev.
*315-1	Mirror angle adjusting pin 45° 出し調整ピン	1	*C3-3	16	△	~48 *Rev.

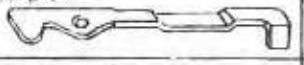
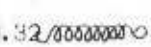
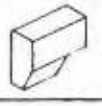
Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
316-2	Mirror angle adjusting lever * ミラー位置出しレバー	1	* C3-3	16	△	FTN ～23 *Rev.
317	Large lever axle 大レバー軸	2	* T2C1 -1	8,15 24	○△	FTN *Rev.
318	Left coupling lever pin レバーピン	1	C5-1	10	△	FTN
319	Coupling lever shaft 連動レバー軸	1	C4	10,15	△	FTN
320	Right coupling lever 右レバー	1	C4	13,15	△	FTN
* 321-1	Mirror up lever アップレバー	1	C8	13	△	FTN ～22 *Rev.
322	Mirror down lever ダウンレバー	1	C7	13,15	△	FTN
323	Mirror down lever sleeve レバー内筒	1	C7	13	△	FTN
324	Down lever axle 軸ビス	1	* T2C1-1	13	○△	FTN *Rev.
325	Mirror up spring retainer はね掛け	1	C8	13	△	FTN
326	Spring retainer 二段ピン	1	C7	13	△	FTN
328	Mirror up holding lever 押えレバー	1	B10	21	△	FTN
329	Mirror up holding lever base レバー座	1	B10	21,27	△	FTN
330	Mirror up holding lever axle レバー軸	2	B10 C3-1	16,21	△	FTN

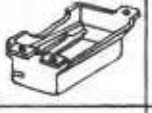
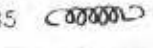
Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
331	Set lever axle レバー軸	1	* T2C1-1	15	○△	FTN *Rev.
332	Set lever セットレバー	1	* T2C1-1	11,15	○△	FTN *Rev.
333-1	Coupling lever 入レバー	1	C25	15	○△	FTN
334	Charge lever チャージレバー	1		8, 9	○	FTN
335-1	Left coupling lever 左側面連動レバー	1	C5-1	10,15	△	FTN
336	Signal lever シグナルレバー 	1	* C2C1-1	11,10 15	○△	FTN *Rev.
337	Mirror angle adjusting base plate 取付板 *	1	*C3-3	16	△	FTN *Rev.
338-1	Aperture button spring 絞りボタンばね d=0.4	1	* T2C1-1	10	○△	FTN ~16 *Rev.
*339-4	Mirror cushion spring 緩衝ばね d=0.45 *	1	* C3-3	16	○△	~46 *Rev.
340	Aperture lever spring d=0.28 絞りレバーばね	1	*T2C1-1	10	○△	FTN *Rev.
341-1	Mirror up spring アップばね d=0.55	1	*T2C1-1	13	○△	FTN *Rev.
342	Mirror down spring ダウンばね d=0.32 	1	*T2C1-1	13	○△	FTN *Rev.
343	Lever cushion 緩衝ゴム 	1	*T2C1-1	13,15	○△	FTN *Rev.
	33FB-61					
345	Mirror up cushion sheet モルトプレン	1	*T2C1-1	16	○△	FTN *Rev.

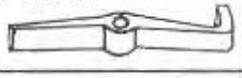
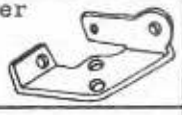
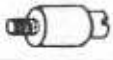
Revision (訂正)

Date Mar. 26th 1976

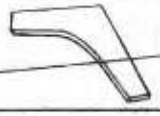
Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
346	Mirror shaft collar (right) カラー	1	* T2C1-1	16	○△	FTN *Rev.
347	Set lever spring セットはね d=0.25	1	* T2C1-1	15	○△	FTN *Rev.
						FTN
*349-1	Mirror up holding lever spring d=0.4 押えばね	1	B10	21	○△	FTN ~15 *Rev.
355	Aperture button pad 絞りボタン飾り	1	T2A1	4	○△	32FB #269 ~41
*357-2	Eye guard 接眼マド	1	A2-1	2	○△	~46 *Rev.
358	Eye guard holder マド受	1	T2A1	2	△	FTN
361-1	Condenser, prism box プリズム受 	1	*T2C1-1	12	○△	FTN *Rev.
362-1	Condenser retainer 押えワク	1		12	○	FTN ~16
364	Prism holding spring 押えはね d=0.35 	2		12	○	FTN
365	Prism holder 押え板	1		12	○	FTN
*367-1	Prism holder sheet 押えシート	1		12	○	FTN ~30 *Rev.

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
368	Coupling lever pin **(right)** レバーピン	1	C4	13	△	FTN
*369-2	Aperture connecting **lever** 連結レバー	1	*C9-1	10	△	~46 *Rev.
370	Aperture lever **axle** レバー軸	1	*T2C1-1	10	○△	FTN *Rev.
371	Aperture lever **spring pin** ばね掛け	1	*C9-1	10	△	FTN *Rev.
372	Aperture lever adjusting pin 調整ピン	1	*C10-1	10	△	FTN *Rev.
373	Eyepiece 横板	2	* TNC15-1	12	○△	FTN *Rev.
*374	Color カラー軸	1				~34 *Add.
376	Side signal lever 横レバー 	1	TNC11	10	○△	FTN
377-1	Side signal lever base 取付板 	1	TNC11	10	△	FTN
378	Signal lever axle レバー軸 	1	*T2C1-1	11	○△	FTN *Rev.
379	Signal lever shoulder screw 段ビス	1	*T2C1-1	11	○△	FTN *Rev.
380	Manual aperture lever shoulder screw 段付軸	2	*T2C1-1	10	○△	FTN *Rev.
381	Side signal lever base screw 小ねじ 1.7R-2.5	1	*T2C1-1	10	○△	FTN *Rev.
382	Manual aperture spring retainer ばね軸	1	*T2C1-1	10	○△	FTN *Rev.

Revision (訂正) Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
383	Side signal lever axle レバー軸	1	TNC11	10	△	FTN
385	**Prism holding plate (left)** 左押板	1		12	○	FTN
386	**Prism holding plate (right)** 右押板	1		12	○	FTN
388	**Signal lever stop plate** レバー受板	1	* T2C1 -1	11	○△	FTN *Rev.
390	**Tin foil** スズハク 	1		12	○	FTN ~3? *Dis.
392	Eyepiece lens holding spring 押えばね d=0.6	1	A2-1	2	○△	FTN
393	**Eyepiece light baffle** シャ光板	1	* TNC15-1	12	○△	FTN *Rev.
* 394-1	Lever shaft レバー軸	1	* C3-3		△	FTN ~23 *Rev.
* 395-1	Retaining plate 押え板	1	* TNC15-1		○△	~43 *Rev.
396	Lever 揺動レバー	1	* C3-3		△	FTN *Rev.
397	Rivet カシメ軸	1	* C3-3		△	FTN *Rev.

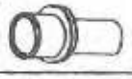
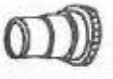
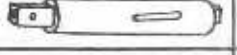
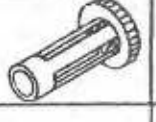
Revision (訂正)

Date Mat. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
401-1	Take-up lever 巻上レバー	1	B15-1	18	△	FTN ~29 20001/40000
402-1	Take-up lever retaining screw 飾りブタ	1		18	○	~41
403	Take-up lever retaining screw nut 押えナット	1		18	○	FTN
404	Take-up lever spring washer マサツバネ	1		18	○	FTN
405	Take-up lever pin レバーピン	1	B15-1	18	△	FTN
406	Take-up lever tube 巻上リング	1		18	○	FTN
407	Release cam pin カムピン	1	B6-1	25	△	FTN
408	Meter contact cam ring 接点リング	1		20	○	FTN
413-1	Contact claw releasing cam 解除カム	1	B6-1	25	△	FTN ~34 20001/40000
414-1	Cam intermediate plate * 中間板	1	B22	25	△	FTN *Rev.
415-1	Lever pawl cam 戻り止め	1		25	○	FTN
416	Take-up lever intermediate base 座板	1		25	○	FTN
417-1	Cam contact claw guide plate * 抜止板	1		25	○	FTN *Rev.
418	Stopper plate ツメ付板	1	B5	25	△	FTN

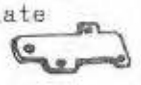
Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
419	Stopper 送りつめ	1	B5	25	△	FTN
420	Stopper spring つめばね d=0.12	1	B5	25	○△	FTN
421	Stopper axle つめ軸	1	B5	25	△	FTN
422	Take-up gear shaft ギア軸 	1	*B3-2	25	△	FTN *Rev.
423	Take-up gear 巻上ギア	1	B4	25	△	FTN
424	Advancing cam 三羽根	1	B4	25	△	FTN
425-1	Idle gear A * アイドルギヤA	1	*B3-2	25	△	FTN *Rev.
426-1	Idle gear B * アイドルギヤB	1	*B3-2	25	△	FTN ~30 30000/40000 *Rev.
*427-2	Idle gear C アイドルギヤC	1	*B3-2	22, 25	△	~46 8001 *Rev.
428-1	Idle gear C axle アイドルギヤC軸	1	*B3-2	22, 25	△	FTN *Rev.
429	Spool upper gear 上ギヤ 	1		25	○	FTN ~30
430	Take-up shaft 巻上軸 	1	B1	23, 25	△	FTN
431	Lever return spring 戻しばね d=0.5	1	B1	23	△	FTN
432-2	Spool スプール 	1	B25	23, 25	△	FTN ~29 20001/40000
433	Spool spring スプールばね	1		25	○	FTN

Revision (訂正)

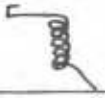
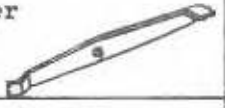
Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
434	Spool collar カラー	1		25	○	FTN
435	Take-up shaft bearing 軸受	1		23	○	FTN
436	Sprocket upper gear スプロケット上ギヤ	1		22,25	○	FTN
437-2	Sprocket shaft スプロケット軸	1		22	○	FTN
438-1	Sprocket スプロケット	1		22	○	FTN
439	Release button shaft spring スプリング d=0.35	2		21, 22	○	FTN
440-1	Rewind button 戻しボタン	1	B17	22	△	FTN
441	Rewind button guide plate 案内板	1	B17	22,27	△	FTN
442	Pawl collar 逆止つめ軸	1	* B3-2	25	*○△	FTN *Rev.
443	Pawl 逆止めつめ	1	* B3-2	25	*○△	FTN *Rev.
444	Pawl spring つめばね d=0.18	1	* B3-2	25	*○△	FTN *Rev.
445	Sprocket shaft bearing スプロ軸受	1		22	○	FTN
446-1	Rack retaining plate ラック押え 	1		24, 27	○	FTN
447	Rack ラック	1	B9-1	24,27	△	FTN
448-1	Charge pin チャージピン	1	B9-1	24	△	FTN

Revision (訂正)

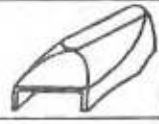
Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
449	Rack coupling pin 連結ピン	1	B9-1	24	△	FTN
450	Rack coupling lever 中間板	1	B9-1	24,27	△	FTN
451	Take-up stroke cam pin カムピン	1	B2	23	△	FTN
452	A.R lever spring ARばね d=0.23	1		23	○	FTN
453	A.R lever release cam ARカム	1		23	○	FTN
454	A.R lever ARレバー	1		23,27	○	FTN
455	Take-up stroke cam セットカム	1	B2	23 27	△	FTN
456-2	Film counter base metal 上地板	1	B11-1	18,20	△	FTN
457-1	Take-up shaft base metal 下地板	1	* B3-2	25	△	FTN *Rev.
* 458-3	Release button cover ring レリーズボタン受け	1	T2A1	2,4	○△	～42 20001 *Rev.
* 459-3	Release button レリーズボタン	1	T2A1	4	○△	～42 20001 *Rev.
460-1	Release inner rod レリーズ内ボタン	1	T2A1	4,21	○△	～41
461	Double exposure preventing lever collar 二重防止レバーカラー	1	B8	21	△	FTN
462	Double exposure preventing lever 二重防止レバー	1	B8	20,21	△	FTN
463	Cam contact claw カム接触つめ	1	B7	25	△	*FTN *Rev.

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
464	Cam contact claw collar つめカラー	1	B7	25	△	FTN
465	Claw shaft つめ軸	1	*B3-2	25	△	FTN *Rev.
466	Claw spring つめばね d=0.26 	1		25	○	FTN
467	Claw washer 3.5×5×1 ワッシャー	1	B7	25	△	FTN
468	Sprocket spring スプロケット受	1		22	○	FTN
469	Release shaft レリーズ軸	1	B8	21	△	FTN
470	B-action lever 作動板	1		21	○	FTN
471	See-saw lever シーソーレバー 	1		21	○	FTN
472	Eccentering pin 偏心ピン	1	B22	25	△	FTN
473	Adjusting pin washer 1.2×2.5×0.8 ピン座金	1	B22	25	△	FTN
476	Idle gear shaft bearing 軸受メタル	1	*B3-2	25	△	FTN *Rev.

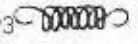
Revision (訂正)

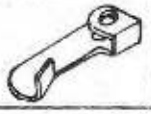
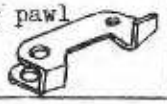
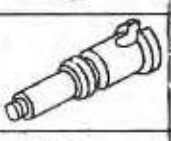
Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
479	Spring 空止はね	1	*T2C1-1	15	○ △	FTN *Rev.
480	Lever axle 空止軸	1	*T2C1-1	15	○ △	FTN *Rev.
481-1	Lever base 空止座金	1	*T2C1-1	15	○ △	FTN *Rev.
482	Coupling lever pin 大レバーピン	1	C25	15	△	FTN
483	Spring stud はね掛け	1	*T2C1-1	15	○△	FTN *Rev.
484	Lever 空止レバー	1	*T2C1-1	15	○△	FTN *Rev.
486-1	Lever base レバー座金	1	*T2C1-1	15	○△	FTN *Rev.
487-1	Spool washer スプール座金	1	B25	23	○△	～29 FTN 20001／40000
488	Spool inner tube スプール内筒	1	B25	23	○△	FTN
489-1	Release screw カプセルRねじ	1	T2A1	4	○△	～41
490	Coupling ring 連結環	1			○	FTN
491	Lever knob 指当て 	1	B15-1	18	○△	～29 FTN 20001／40000

Revision (訂正)

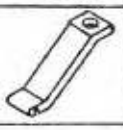
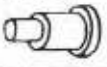
Date Mar. 26th 1976

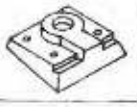
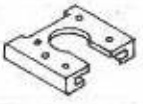
Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
501-1	Film counter scale 枚数目盛	1	B13-1	21	△	FTN
502	Counter ratchet wheel ラチット	1	B13-1	19,20	△	FTN
503	Counter ratchet boss カシメ軸	1	B13-1	20	△	FTN
504	Counter index plate 指標板	1	B11-1	19,20	○△	FTN
505	Counter scale shaft 枚数計軸	1	B11-1	20	△	FTN
506	Counter spring ゼロ戻しばね d=0.25	1	B11-1	20	○△	FTN
507	Counter stop pin 制限ピン	1	B11-1	20	△	FTN
508-1	Counter adjusting pin 調整ピン	1	B19	19,20	△	FTN
509-1	Ratchet advancing lever A 送りレバー	1	B19	20	△	FTN
510-1	Film counter release lever 0戻しレバー	1	B11-1	20	△	FTN
511	Film counter release lever spring 0戻しばね d=0.23 	1	B11-1	20	○△	FTN
512-1	Film counter release lever axle 0戻しレバー軸	1	B11-1	20	△	FTN
513-1	Ratchet advancing B lever 送りレバー	1	B20-1	20	△	FTN
514	Ratchet advancing B lever boss カシメ環	1	B20-1	20	△	FTN
515	Ratchet advancing B lever shaft レバー軸	3	B20-1 B11-1	20	△	FTN

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
516	**Advancing B lever spring** 送りばね d=0.3	1	B11-1	20	○△	FTN
517	**Advancing** pawl **spring** つめばね d=0.23	1	B11-1	20	○△	FTN
518	Advancing pawl 送りつめ 	1	B11-1	20	○△	FTN
519	Ratchet locking pawl 止めつめ 	1	B21	20	○△	FTN
520	Ratchet locking pawl spring 止めつめばね d=0.27	1	B11-1	20	○△	FTN
521	**Ratchet locking** pawl **pin** 止めつめピン	1	B21	20	△	FTN
522-1	Counter scale window 枚数マド	1	T2A1	2	○△	FTN
523-1	**Advancing lever eccentric axle** 偏心軸	1	B11-1	20	○△	FTN
524	**Advancing A lever washer** レバー座金	1	B11-1	20	○△	FTN
525	**Counter scale window frame** マドワク	1	TNA1	2	△	FTN
526	**Adjusting pin** 調整ピン	1	B11-1	20	△	FTN
551-2	Rewinding shaft bearing 巻戻軸受	1	*B18-3	17	○△	～41 *Rev.
*552-3	Rewinding shaft 巻戻軸 	1	*B18-3	17	○△	～47 *Rev.
553	Rewinding **shaft click spring** 巻戻ばね d=0.7	1	*B18-3	17	○△	FTN *Rev.
554-1	Rewinding shaft nut 押え環	1		2,17	○	～41

Revision (訂正)

Date Mar. 26th 1976

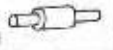
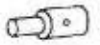
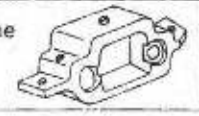
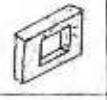
Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
555-1	Rewind knob 巻戻ノブ	1		17	○	～41
556-1	Rewind lever 巻戻レバー 	1	B16-1	17	△	～41
557	Rewind lever knob shaft ツマミ軸 	1	B16-1	17	△	FTN
558	Rewind lever knob ツマミ	1	B16-1	17	△	FTN
559	Rewind lever spring レバーばね	1		17	○	FTN
560	Counter scale shaft washer 2×6×0.5 ワッシャー	1	B11-1	20	○ △	FTN
561-1	Rewind shaft washer 3×6.5×0.6 ノブ押金	1		17	○	～41

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
564	Cover ring 飾り環	1	B26	17	△	~41
565	Cover plate 飾り盤	1	B26	17	○ △	~41
566	Stop pin 回止めピン	1	B26	17	△	~41
*567-2	Accessory shoe base plate シュー座 	1	*A3-1	5	△	~44 *Rev.
*568-1	Accessory shoe ホットシュー 	1	T2A1	5,31	○ △	~46 *Rev.
569-1	Shoe spring シューばね	1	T2A1	5	○ △	~42
570	Insert metal 埋金	1	*A3-1		△	~41 *Rev.
571	Contact spring 押え接点	1	T2A1	5,31	○ △	~41
*572-1	Contact plate 受接点	1	T2A1	5,31	○ △	~45 20001/40000 *Rev.
573	D collar D カラー	1	T2A1	5,31	○ △	~41
574	Washer 接点座環	1	T2A1	5	○ △	~41
575	Pin 押棒	1	T2A1	5	○ △	~41 *Rev.
576	Washer 1.8×3×0.3 シュー座金	(4)	T2A1	5	○ △	~41

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
T4-1	Bottom cover 底板	1		26	○	FTN ～30
T32	Earth piece アース接片	1	*T2B14A-1	8,31	○△	FTN *Rev.
*T36-1	Meter window cover モルトプレン	1	T2A1	2	○△	～41 *Rev.
T202	Bayonet バヨネット	1	*T2C1-1	6	○△	FTN *Rev.
T221-1	Resistor brush 刷子ホルダ	1	*T2D1-1	6	△	FTN *SOP1057 *Rev.
T222	Brush 板ブラシ	1	TND2	6	○△	FTN
T224-1	Resistor マイシ抵抗	1	TND2	6,31	○△	FTN
T225	Conductive plate 導体	1	TND5	6,31	○△	FTN
T226	Brush rivet 止めピン	3	TND2	6	○△	FTN
T234	Resistor base plate 短絡板	1	TND2	6,31	○△	FTN
T237	Click spring screw (S) ばねビス⊖1.7R-1. (S)	1	TND5	6	○△	FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
T350	Mirror up axle ミラーアップ軸	1	*T2C1-1	13	○△	FTN *Rev.
T351	Mirror up button axle ミラーアップボタン軸 	1	TC6	13,14	△	FTN
T352	Axle holder ボタン軸押え 	1	TC6	14	△	FTN
T353	Mirror up lever ミラーアップレバー	1	*T2C1-1	13	○△	FTN *Rev.
T354	Mirror up button ミラーアップボタン	1	TC6	13	△	FTN
T355	Mirror up lever spring ミラーアップレバーばね	1	*T2C1-1	13	○△	FNT *Rev.
*T359-3	Eyepiece frame 接眼ホルダ 	1	*TNC15-1	12	△	~41 *Rev.
T366	Meter window cover メドカバー 	1	*T2C1-1	12	○△	FTN *Rev.
T409	Contact insulating plate 絶縁板	2	TB12	18	△	FTN
T410	Contact retaining plate 接点押え	1	TB12	18	△	FTN

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
T411	Contact A 接点 A	1	TB12	18,31	△	FTN
T412-2	Contact B 接点 B	1	TB12	18,31	△	FTN
T607-1	Battery cap 電池ブタ	1		26	○	～41
T608-1	Battery case 電池ケース	1	T2B14	26,27	△	～41
*T609-2	E collar Eカラー	1	*T2B14A-1	26,31	△	～45 *Rev.
T610-1	Insulating plate 電池ばね	1	T2B14	26,31	○△	～41
T611-1	Insulating washer ラグ板	1	T2B14	26,31	○△	～41
T612-1	Tip A 丸ナット	1	T2B14	26	○△	～41

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
T613-1	Lead wire(blue) コード（青） D4234	1	T2A1	31	○△	～41
T616	Resistor 30, 40, 50, 60, 70, 80, 90, 100Ω 固定抵抗	1	TNC17	12,31	○△	FTN
T617-1	Meter window メータマド	1	T2A1	9	○△	～41
*T618-1	Lead wire (red) D4233 コード（赤）	1	*T2B14A-1	4,31	○△	-41 *Rev.
T619	" コード（赤）	1	*T2B14A-1	31	○△	FTN *Rev.
T620	Lead wire (black) D4231 コード（黒）	1	TB12	18,31	○△	FTN
T621	Lead wire (green) D4236 コード（緑）	1	TND5	31	○△	FTN
T623	Meter resistor 1,1.5,2,2.5 3,3.5,4,4.5,5,5.5,6KΩ 直列抵抗	1		31	○	FTN
T626	Resistor 固定抵抗 350, 400, 450Ω	1	TNC17	12,31	○△	FTN
*T628-1	Lead wire (yellow) D4235 コード（黄）	1	T2B14	31	○△	～41 *Rev.

Revision (訂正)

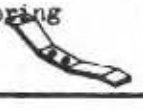
Date Mar. 26th 1976

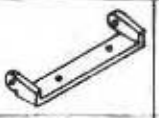
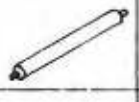
Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
T629	Lead wire (black) D423! コード（黒）	1	TB12	18,31	○△	FTN
T630	Print 配線板	1	TNC17	12,31	○△	FTN
T809	Earth terminal screw 小ねじ⊕2R-2 (3)	2	* T2C1-1	13,15	○△	FTN *Rev.
T813-1	Meter screw 小ねじ ⊕ 1.7R-2 (特)	2		12	○	FTN ～32
T816	Meter contact screw 小ねじ ⊖ 1.4R-3 (特)	2	T2A1 * B11-1	5,18	○△	FTN *Rev.
T823-1	Mirror up coupling shaft pin ロールピン	1	* T2C1-1	14	○△	～31 30000／40000 FTN *Rev.
T827	Mirror up lever washer 座金 2.2×5×0.2	2	* T2C1-1	13	○△	FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
T840	Earth piece screw (S) 小ねじ ⊖2R- 1.5 (特)	1		8	○	FTN
T846	Printed circuits plate screw 小ねじ⊖1.7R- 2.5 (3)	3		13, 17	○	FTN
T847	Terminal plate ターミナル板	1	B27	17, 31	△	～41
T848	Socket cord (blue) ソケットコード (青)	1	B27	31	○ △	～41

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
701-2	Back plate 裏ブタ	1	E1	30	△	FTN
702-2	Pressure plate 圧板	1	E2	30	△	FTN
703	Pressure plate spring 圧板ばね	1	E2	30	△	FTN
704	Pressure plate stud 圧力板カシメピン	2	E2	30	△	FTN
705-1	Pressure plate spring holder pin リベット	4	E1	30	△	FTN ～32
706	Back plate hinge 蝶板	1	E1	29,30	○△	FTN
707-1	Latch retaining plate シャ光板	1	E1	30	△	FTN
708	Latch カギ板	1		28	○	FTN
709	Latch cover カバー	1		29	○	FTN
710	Hinge shaft 蝶板軸	1	E1	30	○△	FTN
711-1	Latch rivet リベット	2	E1	30	△	FTN ～30
712	Latch slide guide カギガイド	2		28	○	FTN
713-1	Film cartridge spring rivet カギ掛けピン	2	E1	30	△	FTN ～35
714	Latch spring カギばね d=0.32	1		28	○	FTN
715	Film cartridge spring パトローレ押え 	1	E1	30	△	FTN

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
716	Roller bracket ローラ受け 	1	E1		△	FTN
717-1	Roller pin ローラピン	2	E1			
718	Roller ローラー 	1	E1		○	FTN

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
801-1	Tripod socket screw 小ねじ ⊕ 2R - 3 (3)	*11	*T2C1-1	11,18 20,21 24,25	○△	FTN ～32 *Rev.
802	Shutter screw S取付ビス	1		9	○	FTN
804-1	Bottom plate screw 小ねじ ⊕ 1.7Q - 2.5 (1)	5		29	○	FTN
805	Bayonet set screw 小ねじ ⊕2R - 3.6 (1)	4	*T2C1-1	6	○	FTN *Rev.
807	Bayonet spring screw 小ねじ ⊕1.7R - 1.8 (1)	6	TND5	6	○△	FTN
808	Index plate screw (S) 小ねじ ⊖1.4R - 1.5 (特)	1	B11-1	20	○△	FTN
809-1	Light baffle plate screw 小ねじ ⊕2R - 4 (3)	1	*T2C1-1	16	○△	FTN ～32 *Rev.
810-1	Front plate screw (S) 小ねじ ⊕2R - 3.5 (特)	5		11,14	○	FTN ～32
811-1	Bayonet screw (S) 小ねじ ⊕ 2R - 3.5 (特)	4	*T2C1-1	6	○	FTN ～32 *Rev.
812-1	Locking pawl shaft screw ⊕1.7R - 3.5 (S) 小ねじ (特)	1	*B3-2	25	○△	FTN ～32 *Rev.
813	Take-up shaft bearing screw 小ねじ ⊕1.7R - 2 (3)	*8	*T2C1-1	11,23 25	○△	FTN *Rev.
814	Sprocket screw スプロビス	1		22	○	FTN
815	Take-up shaft fastening screw ⊖2R - 3 (S) 小ねじ (特)	1		23	○	FTN

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
816	**B-action lever screw** 小ねじ ⊕1.4R-3 (3)	2		21	○	FTN
817	**Advancing cam stop pin** ストレートピン SP1.5-2.5	1	B4	25	△	FTN
818	Screw 小ねじ ⊕2R-4.5 (3)	3			○	～28 30001／40000 FTN
819	**Take-up shaft pin** ストレートピン SP1-4	1		25	○	FTN
820	**Releasing shaft pin** ストレートピン SP1-6	1	B8	21	○△	FTN
821	**Rewind lever pin** ストレートピン SP1-8	1		17	○	FTN
822	**See-saw lever pin** ストレートピン SP1.6-8	1		21	○	FTN
823	Set screw 止めねじ 1.7US-2.5	1			○	～41
824	**Shutter attaching nut** ナット 2N-1.6	1		9	○	FTN
825	**Rack holder screw** 小ねじ ⊕2Q-3.5 (3)	4		25	○	FTN
826	**Latch cover screw** (S) 小ねじ ⊖1.7Q-4 (特)	2		29	○	FTN
827	Aperture lever shaft washer 座金 2.2×5×0.2	4	*T2C1-1	10,15 24	○△	FTN *Rev.
828	Mirror angle adjusting plate screw 小ねじ ⊕2Q-3.5 (1)	2	*T2C1-1	16	○△	FTN *Rev.
829-1	Shutter dial topper screw (S) ⊖2R-3.6 (特) 回転制限ビス	2	*T2C1-1	6	○△	FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
*831a-v	Focus adjusting washer 座金 2.2×5×0.5		*T2C1-1	12	○△	~43 *Rev.
832	Prism box screw 小ねじ ⊕2R-4 (3)	3	*T2C1-1	12	○△	FTN *Rev.
833	Shoe screw 小ねじ ⊕1.7R-2 *(3)	2	T2A1	5	○△	~11 *Rev.
834	Shoe screw 小ねじ ⊕1.7R-5 *(3)	2	T2A1	5	○△	~11 *Rev.
835	**E-ring** E リング E-13	4	*T2C1-1	14,20	○△	FTN *Rev.
836	**Releasing shaft E-ring** E リング E-24	1		21	○	FTN
837	Sprocket shaft washer 座金 3.2×5.5×0.5	1		22	○	FTN
838	Film counter release lever washer 座金 1.8×5×0.2	1	B11-1	20	○△	FTN
841	Mirror down lever washer 座金 2.2×10×0.2	1	*T2C1-1	13,27	○△	FTN *Rev.
842	Shutter spring washer ばね座金	1		9	○	FTN
843	Eyepiece frame screw 小ねじ ⊕2R-3 (3)	2		12	○	FTN
845	Rack adjusting washer 座金 2.1×4×0.1	5		24	○	FTN ~43 *Dis.
847	Manual aperture lever washer 1.9×5×0.5 レバー座金	2	*T2C1-1	10	○△	FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
849	Back focus adjusting washer 2.1X3.5X0.05 バック調整	4		8	○	FTM ～43 *Dis.
850	Advancing A lever screw	2	[illegible]	20,2c	○△	FTK
851	Shutter washer	1		[illegible]	○	FTK
852	Shutter screw	2		8	○	FTK
[illegible]	[illegible]	[illegible]	[illegible]		○	FTK *Rev.
[illegible]	Retaining guide pin	1	[illegible]	4	○	～41
[illegible]	Screw	1		4,18	○	FTM ～[illegible] *Rev.
[illegible]	Tapping screw	2			○	FTM ～2[illegible] [illegible]
[illegible]	E ring	1	[illegible]		○	～41
[illegible]	Screw	1			○	～41

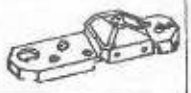
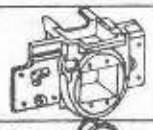
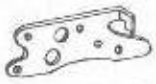
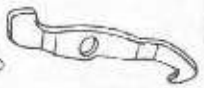
Revision 訂正

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
866-1	Triangular grommet 三角環	2			* ◎	-41 * Rev.
867	Protection pad 当て革	2			* ◎.	-41 * Rev.
868	Protection seat 保護シート	2			○	-41
869a	Washer 座金 6 × 3.1 × 0.02	1	* T2C1-1		* ○△	~43 *Rev
869b	Washer 座金 6 × 3.1 × 0.05	1	* T2C1-1		* ○△	~43 *Rev.*
869c	washer 座金 6 × 3.1 × 0.08	1	* T2C1-1		* ○△	~43 *Rev.

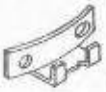
Revision (訂正)

Date May. 19th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
902-1	Front cover 前カバー	1	*T2C1-1	2,6,12	○△	～41 *Rev.
*903-3	Top cover 上カバー 	1	T2A1	2,4,5 17	△	～45 *Rev.
905-1	Bayonet base マウント台	1	TND5	6	△	FTN
906-3	Front plate 前 板 	1	*T2C1-1	13,14 15,16	△	*50F1013 ～41 *Rev.
907-2	Diaphragm coupling ring 絞り連結環	1	TND3	6,7	△	FTN ～30
908-1	Max. aperture scale ring 開目盛環	1	TND2	6	△	FTN
909-2	Shutter A gear ring Aギアリング	1	*T2D1-1	6,31	△	*50F1057 ～41 *Rev.
910-1	Shutter speed scale ring S 目盛環	1	*T2D1-1	6	△	*50F1057 ～41 *Rev.
911-1	Resistor brush ring ブラシ環	1	*T2D1-1	6,31	△	*50F1057 ～41 *Rev.
912	Ratchet release base plate 解除基板 	1	TNC18	2,3	△	FTN
913	Lever retainer 押え板	1	TNC18	3	△	FTN
914	Ratchet release lever 解除レバー	1	TNC18	3	△	FTN
915	Ratchet ラチェット歯	1	TND2	6	△	FTN
916	Ratchet claw ラチェットつめ 	1	TND3	6	△	FTN
917	Max. aperture scale stopper ストッパー	1	TND2	6,7	△	FTN

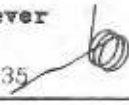
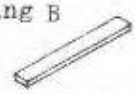
Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
918	Rivet カシメピン	2	TND2	6	△	FTN
919	Coupling stopper ストッパ	1	*T2C1-1	6	○△	FTN *Rev.
*920-3	ASA index ASAツマミ 	1	*T2D1-1	6	△	*50F1057 ～46 *Rev.
921	Lever retaining axle 押え軸	1	TNC18	3	△	FTN
922	Pin 押えピン	1	TNC18	3	△	FTN
923	Ratchet release lever axle レバー軸	1	TNC18	3	△	FTN
924	Pin レバーピン	1	TNC18	3	△	FTN
926	Ratchet claw axle つめ軸	1	TND3	6	△	FTN
927	Rivet カシメピン	2	TND2	6	△	FTN
928	Coupling pin 絞り連結ピン	1	TND3	6	△	FTN
929	Washer 1.5×5×1.5 ワッシャー	1	TNC18	3	△	FTN
*930-2	Name plate screw 銘板ビス ⊕*1.7R-7 (1)	2		2	○	～45 *Rev.
931-2	Screw ⊕1.7R-3 (S) 基板ビス (特)	3	*T2C1-1	2,3,26	○△	FTN ～41 *Rev.
932	Axle ばね軸	1	TNC18	3	△	FTN

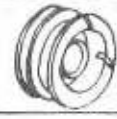
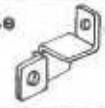
Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
* 933-3	Name plate 銘板			1,2	○	～45 *Rev.
* 934-2	Name plate 銘板	1		1,2	○	～45 *Rev.
935	Lever spring レバーばね d=0.25	1	TNC18	3	○△	FTN
936	Ratchet release lever spring レバーばね d=0.35 	1	TNC18	3	○△	FTN
937	Spring stud ばね掛け	*1	TND2 TND3	6,7	△	FTN ～41 *Rev.
* 937A		1				*Add.
938	Shutter rivet カシメピン	3	*T2D1-1	6	△	FTN *50F1057
939	Spring 引張ばね d=0.25	1	TND3-1	6,7	○△	FTN
940	Rivet カシメピン	4	T2D1-1	6	△	FTN *50F1057 *Rev.
941-1	Ratchet claw spring つめばね	1	TND3-1	7	△	FTN
942-1	ASA friction spring A 抜止め板 A	*1	*T2D1-1	6	○△	*50F1015 *50F1057 ～43 *Rev.
* 942-1A	ASA friction spring B 抜き止め板 B 	1	T2D1-1	6	○△	50F1015 50F1057 ～43 *Add.
944	ASA clamp ASAクランプ	1	*T2D1-1	9	△	*50F1057 ～41 *Rev.
945	Clamp spring クランプばね	1	*T2D1-1	9	△	*50F1057 ～41 *Rev.
947	Light entrance diaphragm 絞り盤	2	*TNC15-1	12	○△	FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
948	CdS CdS受光体	2	TNC17	12,31	○△	FTN
950	Idle gear アイドルギヤ	1	TNC19	11	△	FTN
951	Idle gear axle アイドルギヤ軸	1	TNC19	11	△	FTN
952	Idle gear base plate シャッタ目盛 アイドルギヤ板	1	TNC19	11	△	FTN
953	Shutter speed scale gear 目盛ギヤ	1	TNC20	10	△	FTN
954	Gear shaft 目盛軸	1	TNC20	10	△	FTN
955	Winding shaft 巻付コロ	1	TNC20	10	△	FTN
956-1	Guide roller 案内コロ	1	TNC11	10	△	FTN
957-1	Roller shaft コロ軸	1	TNC11	10	△	FTN
958	Connecting string ヒモ	1	TNC21	10,12	△	FTN
959	Barrel drum 香函 	1	* TNC22-1	13	△	FTN *Rev.
960-1	Barrel arber 香函軸	1	* TNC22-1	13	△	FTN ～31 *Rev.
961	Main spring ゼンマイ	1	* TNC22-1	13	○△	FTN *Rev.
962	Barrel holder plate 取付板 	1	* TNC22-1	13	△	FTN *Rev.

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
963	**Shutter speed** scale plate S目盛板	1	TNC21	10,12 13	△	FTN
964	Fresnel mask 間隔座	1	TNC23	12	△	FTN
965	Down spring stud ばね掛け	1	*T2C1-1	13	○△	FTN *Rev.
966	Gear shaft bearing ギア軸受	1	*T2C1-1	10	○△	FTN *Rev.
969	Scale mirror 目盛ミラー	1	*T2C1-1	12,16	○△	FTN *Rev.
970	Shutter speed scale mask 明示板	1	TNC23	12	△	FTN
971-1	Meter メーター	1	T2C24	12,34	△	
972	Screw 小ねじ(+)1.4Q-2.5(3)	2	*T2C1-1	6	○△	FTN *Rev.
*973	Meter needle index 指標板	1	T2C24	12	△	FTN *Rev.
*974	Click spring クリックばね	1	*T2C1-1	6	○△	FTN *Rev.
976-1	Washer 1.8×3×2.9 銘板ワッシャー	2		2,	○	FTN
977	ND filter フィルター	2		12	○	FTN

Revision (訂正)

Date Mar. 26th 1976

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
G1-1	Mirror ミラー	1	*T2C1-1	16	○△	FTN *Rev.
G2-1	Fresnel フレネル	1		12	○	FTN
G3-1	Condenser lens レンズ	1		12	○	FTN
G4-1	Prism プリズム	1		12	○	FTN
G5	Eyepiece lens レンズ	1	C16	12	△	FTN
G6	" レンズ	1	C16	12	△	FTN
G7-1	Eyepiece dust proof glass レンズ	1	A2-1	2	○△	FTN
G11	Light acceptance fresnel lens レンズ	2	* TNC15-1	12	○△	FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

2. Subassembly list

部組品一覧表

31F3B - R.2021.A

No. of Subassembly 部組品番号	Name 名称	Pcs. per Unit 1台分個数	No. of Constituent parts 構成部品番号	Reference Fig. No. 参照図番	Remarks 備考
T2A1	Top cover (T2) T2 型用上フタ部	1	*903-3, 38, 309-1, 358, *458-3, 525, 522-1, *T36-1, T617-1, 355, *459-3, 460-1, 489-1, 856-1 *33-2, *568-1, *569-1, 571, 573, *572-1, 574, 575, 576, 833, 834, T816, T613-1, 310-2, *865-1, 861, *A3-1	2	*Rev.
A2-1	Eyeguard 接眼窓部	1	*357-2, 392, G7-1	2	*FTN ○ *Rev.
*A3-1	Shoe シュー座部	1	*567-2, 570	5	*Rev.
B1	Take-up shaft 巻上軸部	1	430, 431	23	*FTN *Rev.
B2	Take-up stroke cam セットカム部	1	455, 451	23	*FTN *Rev.
*B3-2	Take-up shaft base metal 下地板部	1	457-1, 422, 425-1, 426-1, 427-2 428-1, 465, 476, 442, 443, 444, 812-1	23	*FTN *Rev.
B4	Take-up gear 巻上ギア部	1	423, 424, 817	25	*FTN *Rev.
B5	Stopper 送りつめ部	1	418, 419, 420, 421	25	*FTN *Rev.
B6-1	Contact claw releasing cam 接触つめ解除カム部	1	413-1, 407	25	*FTN *Rev.
B7	Cam contact カム接触つめ部	1	463, 464, 467	25	*FTN *Rev.
B8	Release shaft レリーズ軸部	1	469, 461, 462, 820	23	*FTN *Rev.
B9-1	Rack ラック部	1	447, 448-1, 449, 450	24	*FTN *Rev.
B10	Mirror up holding lever ミラーアップ押えレバー部	1	328, 329, 330×2, 349-1	21	*FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

Subassembly list

部組品一覧表

31F3B - R.2021.A

No. of Subassembly 部組品番号	Name 名称	Pcs. per Unit 1台分個数	No. of Constituent parts 構成部品番号	Reference Fig. No. 参照図番	Remarks 備考
B11-1	Film counter base matal 上地板部	1	456-2,505,507,515×2,526,504,510-1,511,512-1,516,~~*835~~ 506,523-1,*524,520,560,808,*835×3,838,850,517,518,*T816,TB12,B13-1,B19,B20-1,B21} *	20	*FTN *Rev.
TB12	Meter switch 露出計スイッチ部	1	T411,T620,T629,T409×2,T410,T412-2,~~*T816~~	18	*FTN *Rev.
B13-1	Film counter scale 枚数目盛板部	1	503,501-1,502	20	*FTN *Rev.
T2B14	Battery case 電池ケース部	1	T608-1,T610-1,T611-1,T612-1 *T628-1,850	26	*Rev.
*T2B14A1-1	Earth collar アースカラー部	1	*T609-2,T619,*T618-1,T32	31	*Rev.
B15-1	Take-up lever 巻上レバー部	1	401-1,405,491,860×2	18	*FTN *Rev.
B16-1	Rewind lever 巻戻しレバー部	1	556-1,557,558	17	
B17	AR button ARボタン部	1	441,440-1	22	*FTN *Rev.
*B18-3	Rewind shaft 巻戻し軸部	1	551-2,*552-3,553	17	*Rev.
B19	Ratchet advancing A lever ラチェット送りレバーA部	1	509-1,508-1	20	*FTN *Rev.
B20-1	Ratchet advancing B lever ラチェット送りレバーB部	1	513-1,514,515	20	*FTN *Rev.
B21	Ratchet locking pawl 止めつめ部	1	519,521	20	*FTN *Rev.
B22	Cam intermediate plate カム中間板部	1	414-1,472,473	25	*FTN *Rev.
B23	Eyelet bush つり環部	*2	*11-1,*43	2	*FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

Subassembly list

部組品一覧表

31F3B - R.2021.A

No. of Subassembly 部組品番号	Name 名称	Pcs. per Unit 1台分個数	No. of Constituent parts 構成部品番号	Reference Fig. No. 参照図番	Remarks 備考
B24	Spool gear スプール上ギア部	1	429, 433,434	25	*FTN *Rev.
B25	Spool スプール部	1	432-2*487-1,488	23	*FTN *Rev.
B26	*Rewind knob cover ring *巻戻しノブ飾りリング	1	564, 565, 566	17	
B27	Terminal plate ターミナル板部	1	T847, T848	31	
*T2C1-1	Front plate T2型用前板部	1	906-3,16-1,19-1,34-1,35,37, 216-1,217-1,306-2,*307, 308-1,312*313-2,317,324,331, 332,336,338-1,340,341-1,342, 343,345,346,347,361-1,370, 378,379,380×2,381,382,388, 479,480,481-1,483,484,486-1, 801×3,809-1,813×4,827×3, 828×2,829-1×2,831×3, 832×3, 835,841,847×2,965,966,969, 978,982,983,984,T350,T353, T355,T366,T809×2,T823-1,919 T827×2,853×2,303,G1-1,234-1 805×4,811-1×4,902,931-1×2 * 972×2,974,980-1,T202,~~942-1×2~~ C2-2,C3-3,C4,C5-1,TC6,C7, C8,C9-1,C10-1,C12,C13,C14-1 TNC11,TNC18,TNC19,TNC20, TNC21,TNC22-1, C26,T2D1, TND2,TND3,TND5,D7-1,C25 **	10-15	*Rev. *Add.
C2-2	Mirror support チリ取り部	1	301-2,302-1×2,304-1,305-1	16	*FTN *Rev.
*C3-3	Mirror angle adjusting lever ミラー位置出しレバー部	1	337,315-1,316-2*339-4*394-1 396,397	16	*FTN *Rev.
C4	Coupling lever shaft 連動レバーシャフト部	1	319,320,368	15,16	*FTN *Rev.
C5-1	Left coupling lever 左連動レバー部	1	335-1, 318	10	*FTN *Rev.
TC6	Mirror up button ミラーアップボタン部	1	T354, T351, T352	14	*FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

Subassembly list

部組品一覧表

31F3B - R.2021.A

No. of Subassembly 部組品番号	Name 名称	Pcs. per Unit 1台分個数	No. of Constituent parts 構成部品番号	Reference Fig. No. 参照図番	Remarks 備考
C7	Mirror down lever ミラーダウンレバー部	1	322, 323, 326	13	*FTN *Rev.
C8	Mirror up lever ミラーアップレバー部	1	321-1, 325	13	*FTN *Rev.
*C9-1	Aperture connecting lever 連結レバー部	1	*369-2, 371	10	*FTN *Rev.
*C10-1	Aperture lever 絞りレバー部	1	*314-2, 372	10	*FTN *Rev.
TNC11	Side signal lever シグナル横レバー部	1	377-1,376,383,956-1, 957-1	10	*FTN *Rev.
C12	BC gear BCギアー部	1	233,229,230	10,11	*FTN *Rev.
C13	D gear Dギアー部	1	227,231,232	11	*FTN *Rev.
C14-1	Self-timer lever shaft セルフレバー軸部	1	17-1, 18	11	*FTN *Rev.
*TNC15-1	Eyepiece frame (including CdS) *TN型用接眼受台部	1	*T359-3,31,373×2,393,395-1, 947×2,G11×2	12	*FTN *Rev.
C16	Eyepiece glass 接眼レンズ	1	G5, G6	12	*FTN *Rev.
TNC17	Printed circuits plate プリント配線板部	1	T630,948×2,T616,T626,	12	*FTN *Rev.
TNC18	Ratchet release base plate 解除機構板部	1	912,913,922,914,924,981,921, 923,929,932,935,936	3	*FTN *Rev.
TNC19	Idle gear シャッタ目盛用アイドルギア部	1	952,950,951	11	*FTN *Rev.
TNC20	Gear shaft シャッタ目盛ギア軸	1	954, 953, 955	10	*FTN *Rev.

Revision (改正)

Date Mar. 26th 1976

Subassembly list

部組品一覧表

31F3B - R.2021.A

No. of Subassembly 部組品番号	Name 名称	Pcs. per Unit 1台分個数	No. of Constituent parts 構成部品番号	Reference Fig. No. 参照図番	Remarks 備考
TNC21	Shutter speed scale plate 速度目盛板部	1	963, 958	10,12	*FTN *Rev.
*TNC22-1	Barrel drum 香鼓部	1	962,959,*960-1,961	13	*FTN *Rev.
TNC23	Fresnel mask フレネル開閉座部	1	964, 970	12	*FTN *Rev.
T2C24	Meter assembly メーター部	1	971-1, 973	12	
C25	Large lever 大レバー部	1	333-1, 482	17	*FTN *Rev.
*C26-1	M button Mボタン部	1	*215-2, *214-3, *211-1,*219	14	*Rev.
*T2D1-1	Shutter gear (T2) T2型用シャッタギア部	1	909-2,910-1,*911-1,*920-3, 938×3,*940×4,*942-1,*942-1A, 944,945,*T221-1	6	*Rev.
TND2	Max. aperture scale ring 開放口径目盛板部	1	908-1,915,917,918×2,927×2, 937,T222,T224-1,T226×3,T234	7,6	*FTN *Rev.
TND3	Diaphragm coupling ring (TN) TN型用絞り連動板部	1	907-2,916,926,928,937,939, 941-1	6,7	*FTN *Rev.
TND5	Bayonet base (TN) TN型用バヨネット座部	1	905-1,208×3,807×6,T225,T237, T621,213-1,212	6	
*D7-2	Lens lock pin 着脱ピン部	1	*213-2, *212-1	14	~42 *Rev.
T2D8	Resistor brush ring 摺動ブラシリング	~~1~~	~~911-1,920-1,940×4,T221-1~~	6	*Dis.
E1	Back plate 裏ブタ部	1	701-2,705×4,706,707-1,710, 711-1,713,715,26,39×2,716, *717-1,718,*E2	30	*FTN *Rev.
E2	Pressure plate 圧板部	1	702-2, 703, 704×2	30	*FTN *Rev.

Revision (訂正)

Date Mar. 26th 1976

NIKON NIKKORMATS Fs,FT,FTn

by Kenneth Parchinski

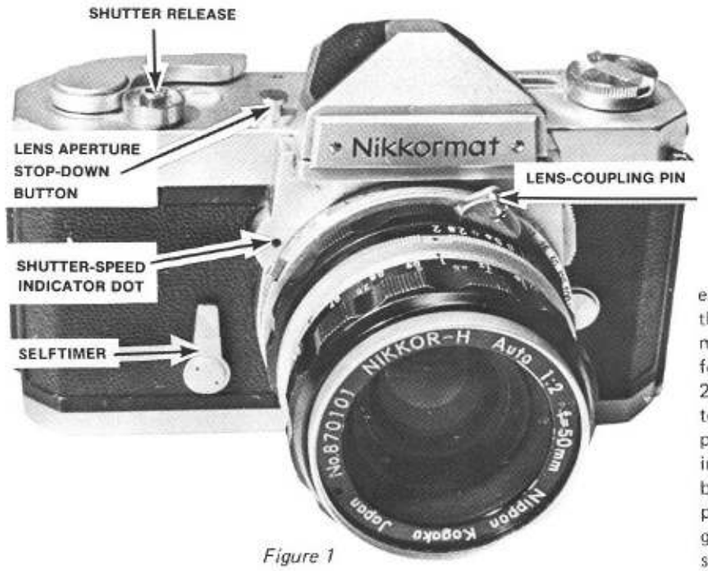


Figure 1

Nikkormats are easy to use and easy to repair. The ease in repairing these units can be attributed to their modular design. There are basically four pieces: 1) Copal Square shutter, 2) mirror box/metering system, 3) counter, and 4) body frame with transport parts. Nikkormats can be disassembled in a matter of minutes. After you have become accustomed to their design and pattern of behavior, you will be able to give accurate estimates and locate sources of trouble without even taking the camera apart.

Below are the characteristics of the different models to help in determining which one you have:

Fs— no meter

FT— match-needle meter system;
manual lens indexing

FTn— match-needle meter system;
automatic lens indexing;
shutter speeds visible in viewfinder;
multiple slotted take-up spool

FT-2— same as FTn plus:
hot shoe;
"K" screen (having both split image and micro prism focusing aids);
single-threaded sync socket

NOTE: the FT-2 is not covered in this article but should be similar except for sync switching in the new shutter.

Another nice thing about the three models of Nikkormat is their parts interchangeability. They all use the same Copal Square shutter, wind parts and most of the mirror box parts. The parts that differ the most are in the metering section and cosmetic parts.

Many parts can be purchased as a subassembly or as separate small parts. Sometimes it is faster and cheaper to replace a unit than to repair it, especially when there is a large number of damaged pieces. There are a few cosmetic changes in the Nikkormats that usually show up in the next model design.

Figures 1 through 4 show all the controls of the cameras. In the illustrations you will note some difference in the bodies, two cameras were used, an Ft and FTn. Figure 2 shows an Ft model. Its ASA must be set against the maximum lens aperture.

Figure 4 shows an FTn model. Set the ASA by sliding the black index over the ASA desired. The maximum lens aperture is set automatically when the lens is installed. This mechanism is explained later in the article.

Counter, Mirror Box, and Shutter Removal

Remove the bottom cover by unscrewing the two screws shown in Figure 4. The battery and rewind button will be loose; be careful not to lose them.

To remove the top cover, Fig. 5, start by removing the screw on the side next to the wind lever. Then remove the two screws holding the front nameplate, and lift off the nameplate. Note that the FTn has two spacers underneath the nameplate. Remove the eyepiece (optional).

Next, remove the wind-lever cap screw by turning it counterclockwise—sometimes these can really stick. Open the back cover and insert a tweezer in the rewind shaft and unscrew the rewind knob counterclockwise. The rewind lever spring will be loose, Fig. 6; remove it. Using a Multispan wrench, remove the rewind shaft nut and wind-lever-screw nut and washer (counterclockwise).

Now you can pull the top cover up. Be careful, as sync wires are attached to the top cover, Fig. 7. Unsolder the sync wires and the yellow wire on the circuit board over the pentaprism. Pull the insulator on the red wire back and unsolder the two red wires.

Figure 2

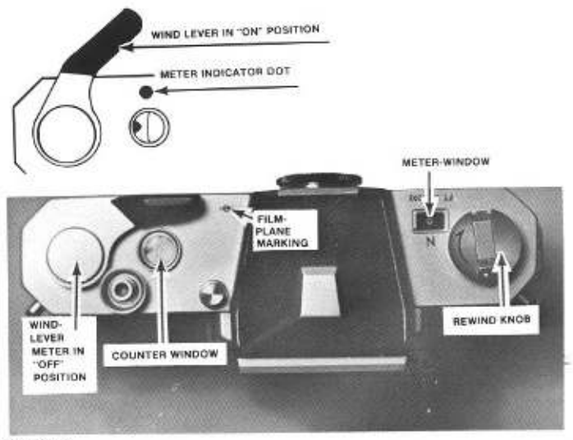


Figure 3

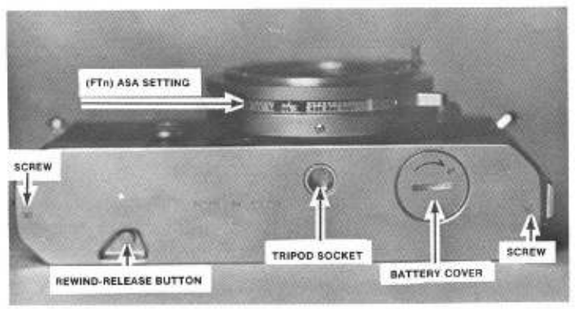


Figure 4

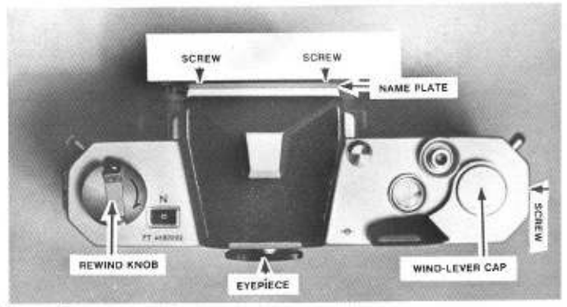


Figure 5

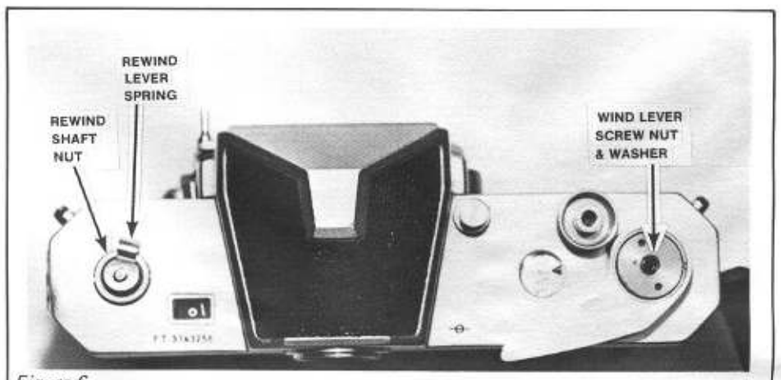


Figure 6

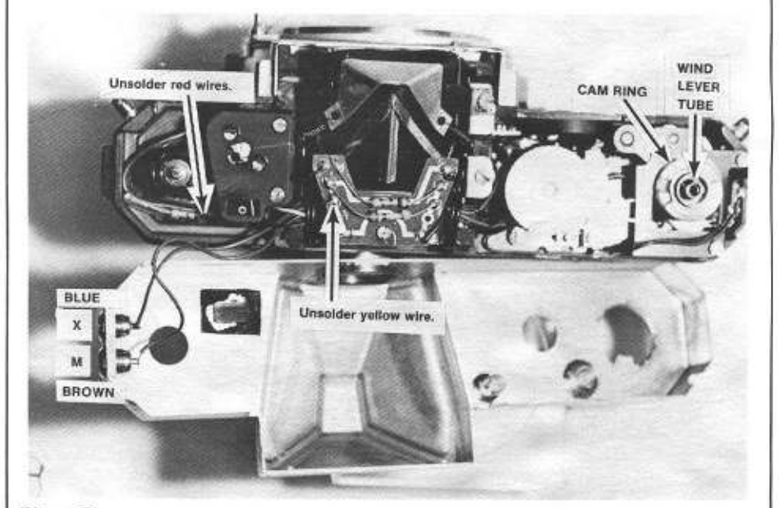


Figure 7

The counter assembly and its three retaining screws are shown in Figure 8. Removing the three screws will allow lifting the counter assembly out of the body. (You won't be able to remove it completely at this point, however, because of the meter switch wires.) Remove the wind-lever tube and cam ring, Fig. 7.

Set the shutter "B," peel back the front leatherette, and remove the five screws, Fig. 9. Removing the front plate/mirror box is hard the first time. It's even harder to install it, but, after doing it once, it doesn't seem as difficult. Tilt the mirror box out from the top and pull up while wiggling it from side to side.

As seen in Fig. 10, the "B" lever sticks out the side of the shutter when set to "B." It's an easy way to tell if it is set right before replacing the mirror box. To remove the shutter, if necessary, unscrew the two screws at the top of the blade assembly. The third screw is located at the lower rear of the body.

The Shutter

Having removed the shutter, you can now either repair it or replace it or one of its subassemblies if necessary. The four basic pieces of the shutter are the self timer, the slow speed gear train, the blade assembly, and the speed mechan-

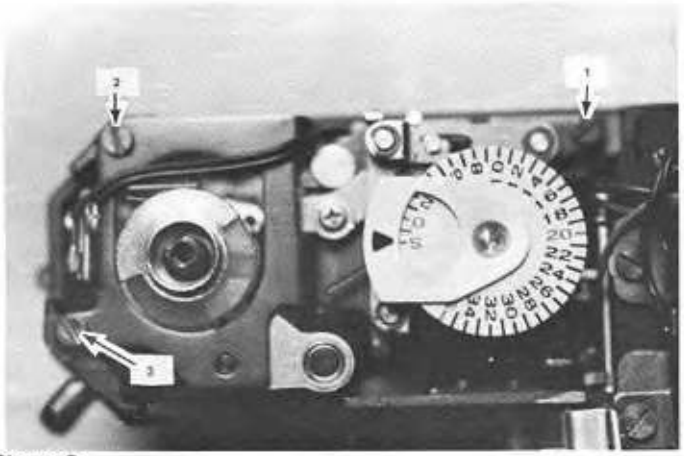


Figure 8

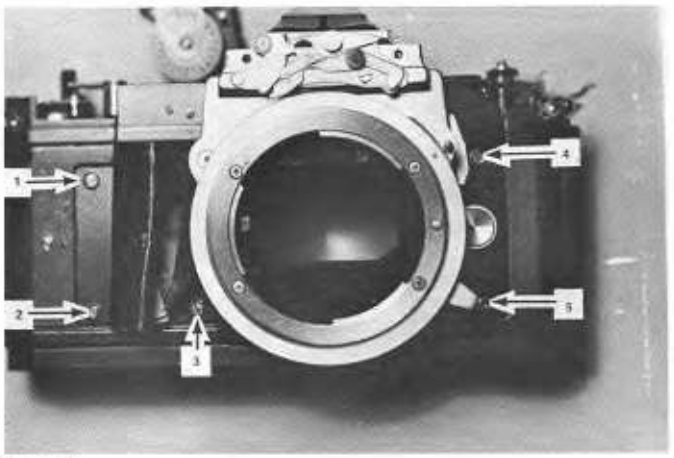


Figure 9

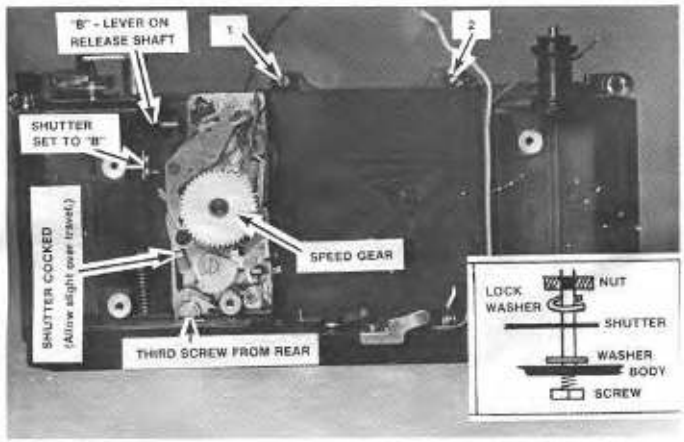


Figure 10

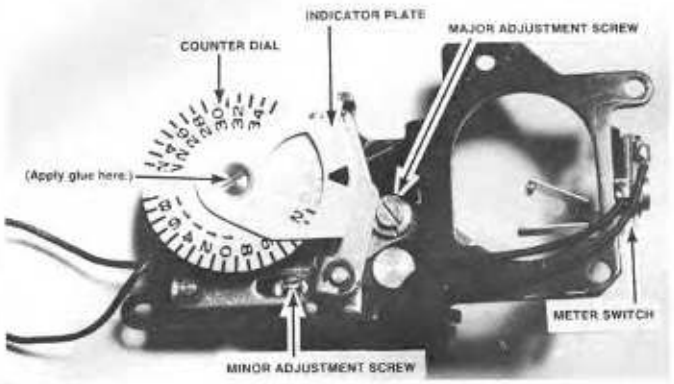


Figure 11

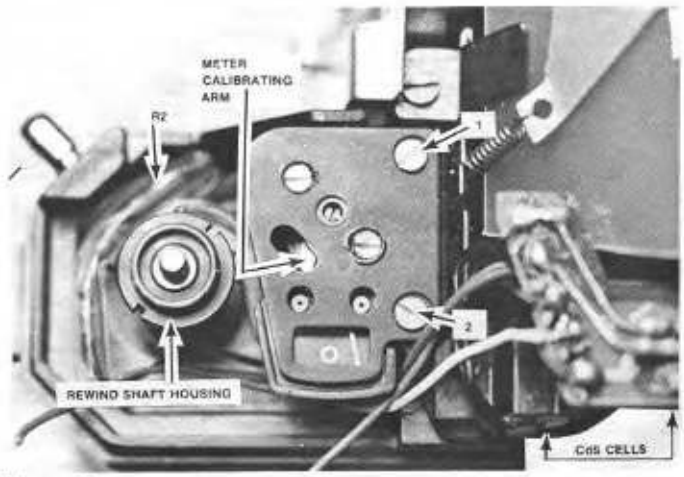


Figure 12

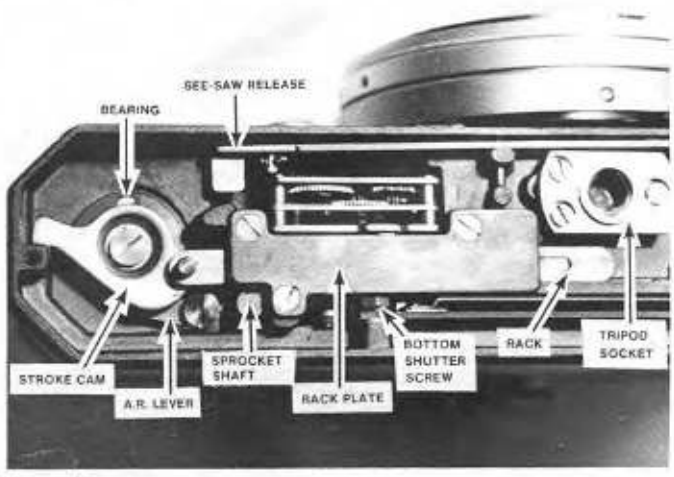


Figure 13

ism. National Camera has a very good *Area Workshop Workbook* book on Copal Square shutters if you are interested in repairing them yourself.

The Counter

Figure 11 shows the counter subassembly out of the camera body. This assembly causes very little trouble and is easily fixed. At times it is necessary to replace the meter switch, which is held by two screws. Be careful of wire routing as this can cause counter problems. The next problem usually encountered is the indicator plate being loose. Align the plate with "S," tighten the screw, and add a dab of glue to the screw. Another possible problem is that the counter doesn't count or counts two numbers at a time. This can be adjusted with the two adjustments provided. Use the minor adjustment first and, if it's not enough, use the major adjustment.

The Meter System

To turn on the meter system, the wind lever must be pulled out past the red dot on the top cover. The resistance of the variable resistor is determined by the ASA—shutter speed—f/stop setting.

To calibrate the meter system, set in ASA 100 at f/5.6 and check the following points: EV 14 1/500; EV 11 1/60; EV 9 1/15. Calibrate by moving the meter calibrating arm in the meter movement cutout, Fig. 12. Then turn off the meter to see if a correct "off" position is obtained as in diagram 1.

If the indicator points below the off position, change R2 (in the plastic sleeve) and start the calibration procedure all over again. To replace the meter, remove screws 1 and 2, and the rewind shaft housing, and slide out the meter. The most frequent cause of trouble is when the needle jumps while turning the f/stop or speed ring. This is due to a bad variable resistor ring which is covered later in this text.

Advance Mechanism Cocking

Figure 13 shows the bottom of the camera body. It is always good to check the tripod screws for tightness. The stroke cam is connected to the wind lever with the takeup spool shaft. The rack cocks the shutter and the mirror box. A top view of the advance mechanism is shown in Figure 14. Note the new type of sprocket-gear driver. To start disassembly of the top wind section, Fig. 15, hold the release shaft at point A while turning the top of the release-shaft plate from positon B to C.

If the lower part of the release shaft slips while the upper part is being turned, it will bend the B lever that is lower on the shaft, Fig. 10. To disassemble the rest of the pieces of the top transport section, push the pin out of the spool shaft. It is a good idea to scribe a mark on each piece as it is removed to indicate the correct position for reassembly. The order of disassembly of the transport pieces is shown in Figure 16.

To remove the take-up base metal, remove the three screws shown in Figure 17 and lift up the plate. Note the old type sprocket gear driver. The spool-

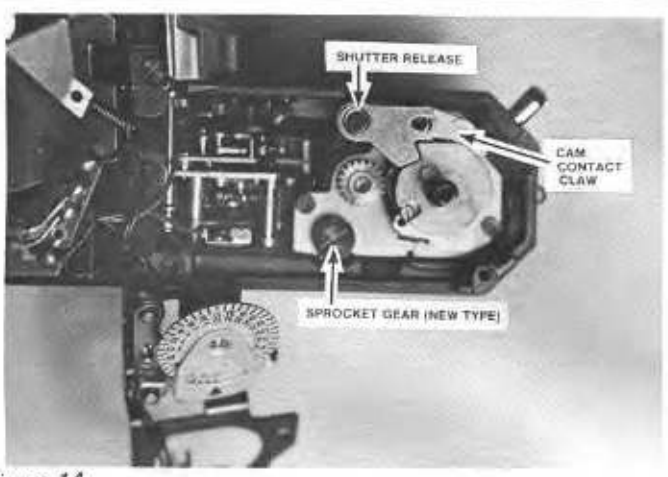


Figure 14

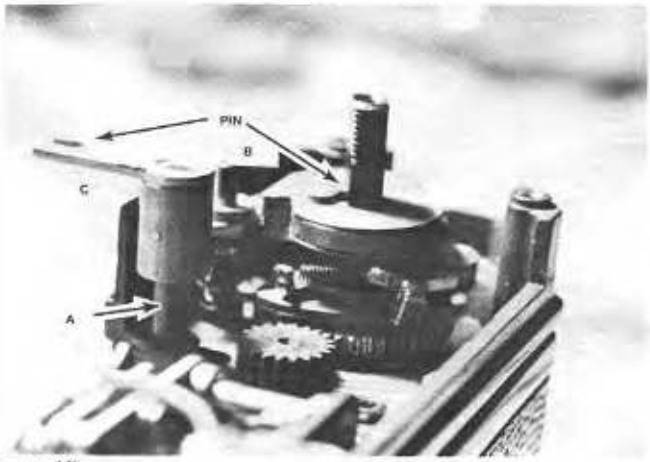


Figure 15

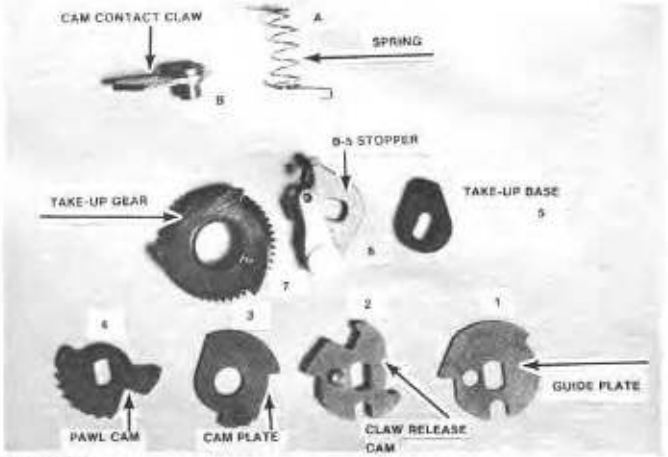


Figure 16

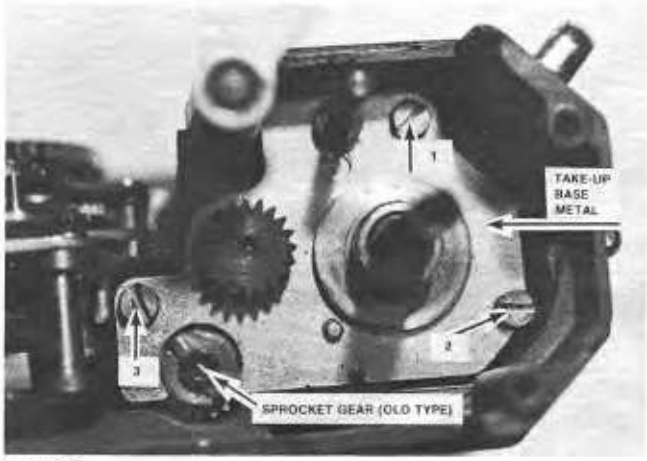


Figure 17

The author, a graduate of National Camera, currently lives and works as a camera technician in Salt Lake City, UT. He is a frequent contributor to the reader's Data Exchange.

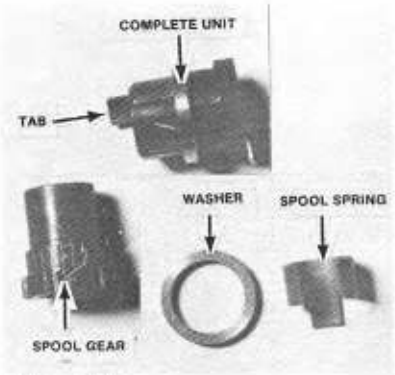


Figure 18

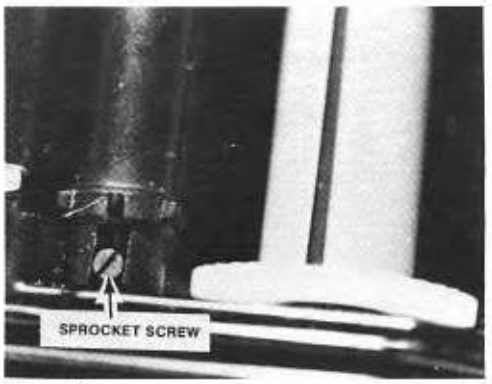


Figure 19

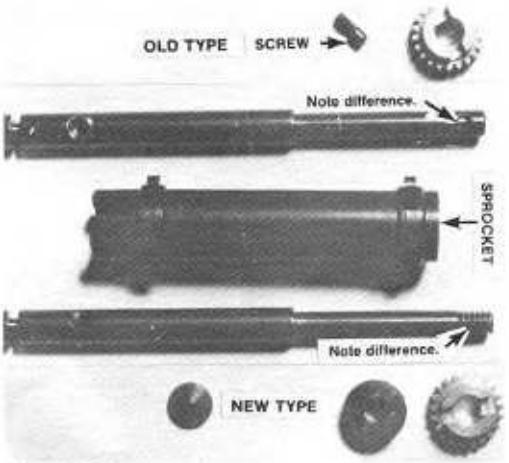


Figure 20

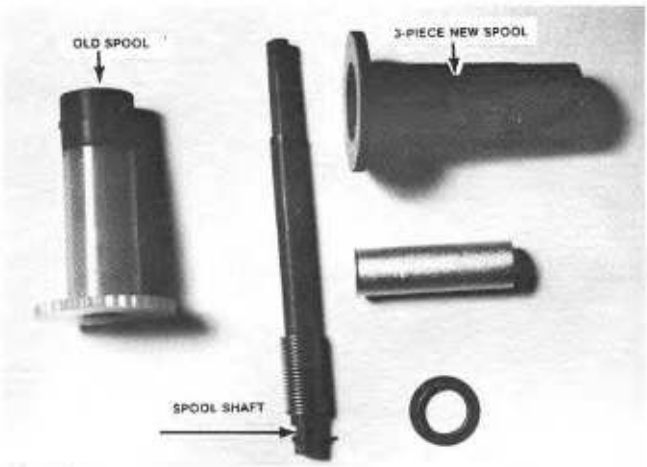


Figure 21

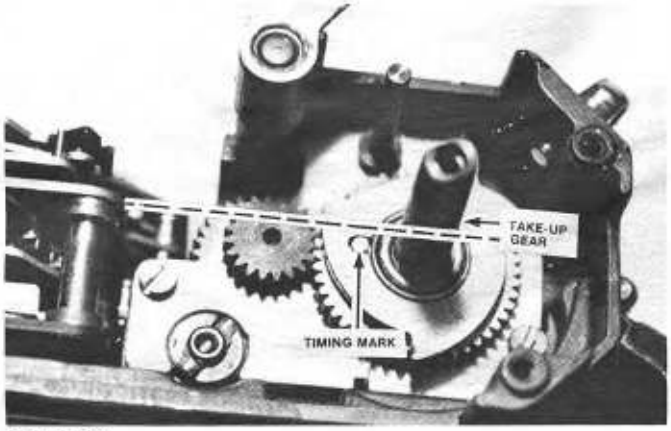


Figure 22

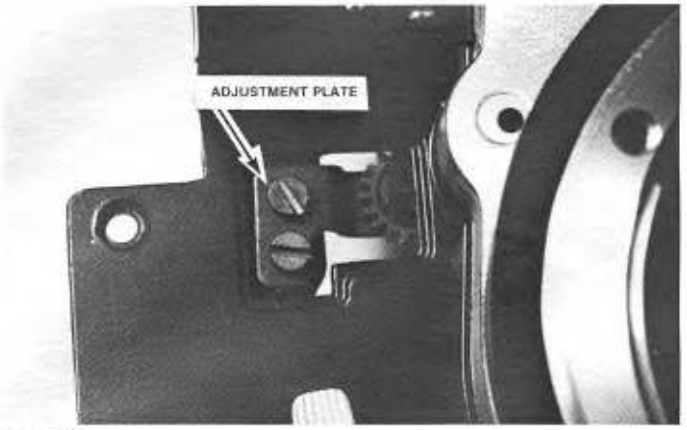


Figure 23

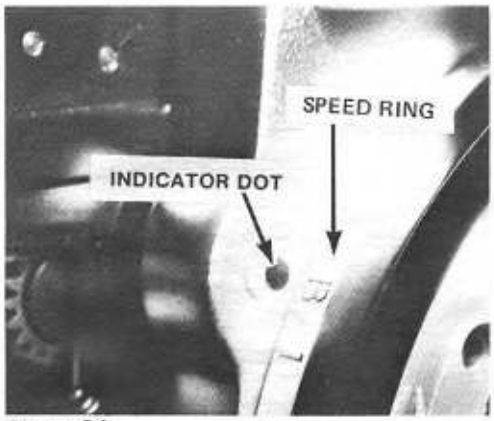


Figure 24

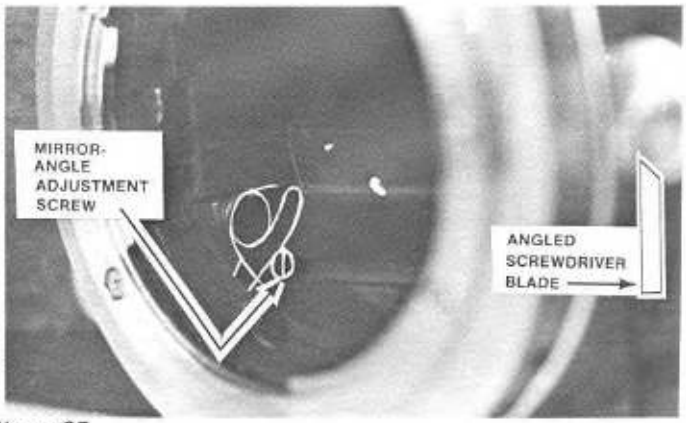


Figure 25

driving unit is shown in Figure 18. The tab fits into a cutout in the spool. You may wish to disassemble this unit and clean it. Apply only a slight amount of grease to the spool spring. Spool tension is adjusted by bending the spool spring.

To remove the sprocket, it is only necessary to remove the top and bottom covers of the camera and the counter assembly. Remove the sprocket-gear driver and the sprocket screw, Fig. 19. Remove the sprocket shaft from the bottom of the camera. Be careful not to lose the spring and washer in the sprocket. In Figure 20 the new type and old type sprocket shafts and driving systems are shown. Either one may be substituted if all the correct parts are used with the right shaft.

Figure 21 shows the old one-piece takeup spool. If it is necessary to replace a takeup spool, update it to the new multislot type. The only critical timing point on the top winding section is between the sprocket and the take-up gear, Fig. 22. Determine whether the camera has old or new type spool and set accordingly before installing the take-up gear.

To remove the old type sprocket drivers, refer to Figure 22: just remove the screw and lift up the gear. Refer to Figure 14 for the new type sprocket gear driver. To remove it, hold the sprocket while turning the screw clockwise (left-hand thread). Then unscrew the driver and lift up the gear.

The timing of the bottom wind system is simple and retiming will only be necessary if the shutter or rack was removed. The rack pin must pass through the mirror cocking lever, Fig. 26. Push the shutter-cocking gear towards the spool end of the camera until a resistance is felt, then install the rack. Try cocking the shutter to confirm a slight overtravel, Fig. 10.

The Mirror Box

If the shutter speed setting ring is either hard to turn or has a lot of slack, adjust it by moving the idler gear adjustment plate shown in Figure 23. When installing the shutter-speed ring or mirror box, set the shutter-speed ring to "B," Fig. 24. After replacing the mirror box or speed ring, check to see if the numbers center next to the indicator by going up and down the scale. If they don't, remove and change the timing one gear tooth at a time until it's right.

Figure 25 shows the eccentric for the mirror-angle adjustment. You can adjust the view finder focus with this screw if it is not too far out of adjustment. It is a good idea to make a special screwdriver for this purpose. Grind the tip of a screwdriver to approximately a 45-degree angle.

Figure 26 shows an inside view of the rack pin passing through a slot in the mirror-cocking lever. The small see-saw lever to the right of the mirror cocking lever is the latch for holding the right-side coupling lever when the mirror box is cocked.

Next, study Figures 27, 28 and 29. To duplicate the action of the mirror box in the camera body, hold the right-side coupling lever back while pushing the bottom coupling lever forward until it is latched by the set lever. Upon re-

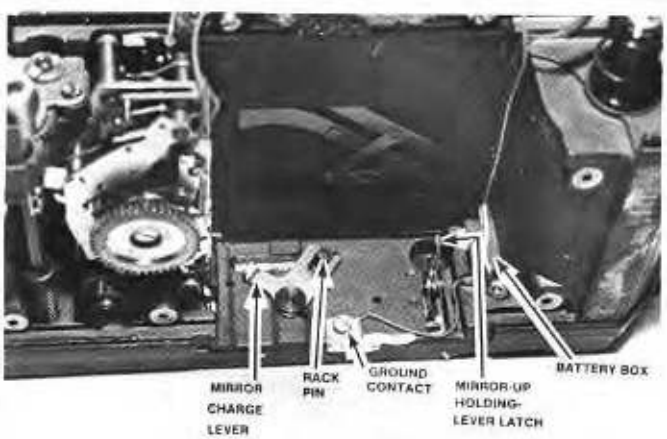


Figure 26

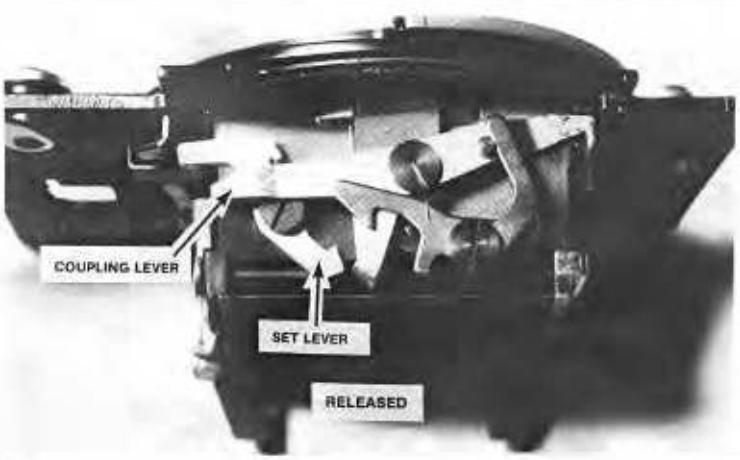


Figure 28

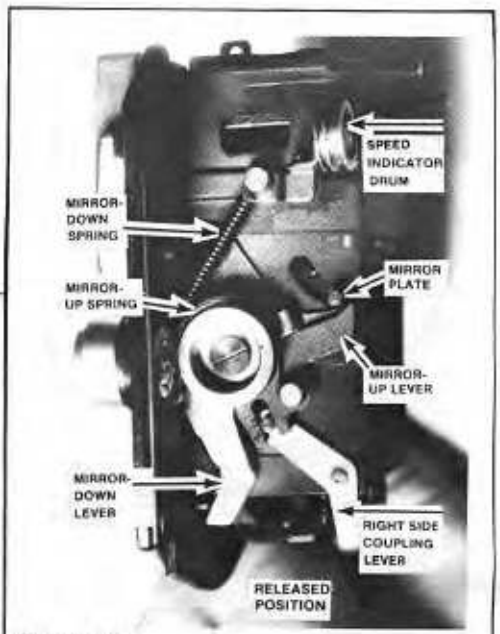


Figure 27

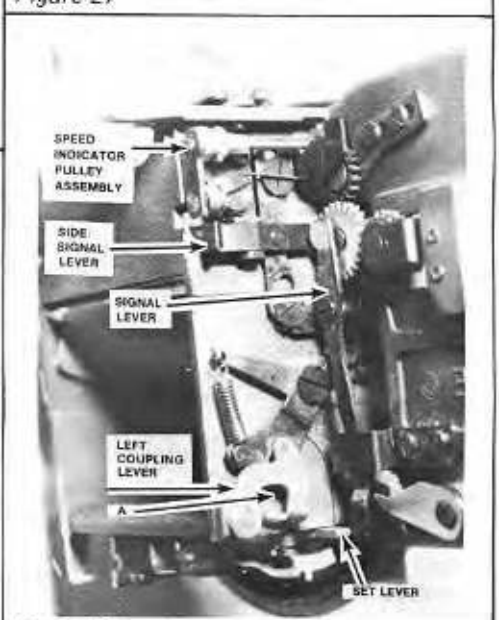


Figure 29

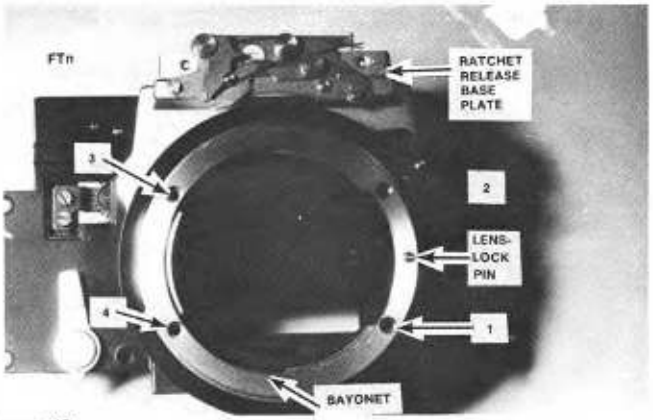


Figure 30

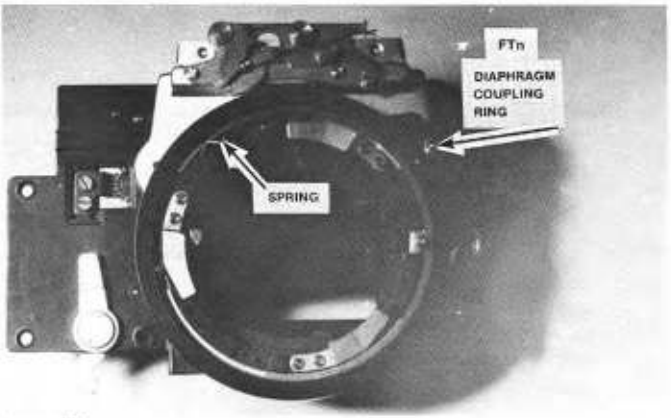


Figure 31

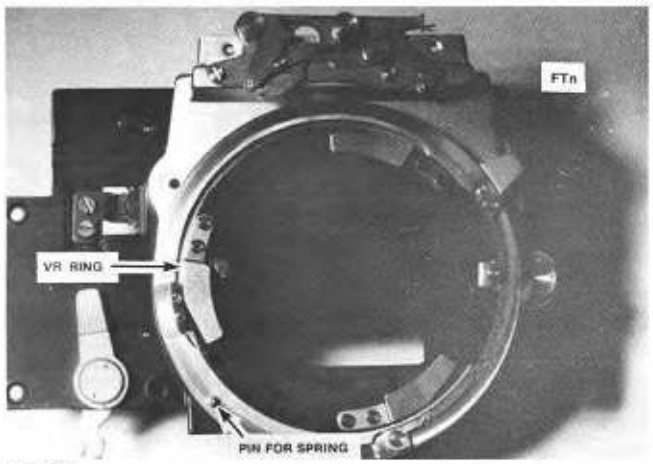


Figure 32

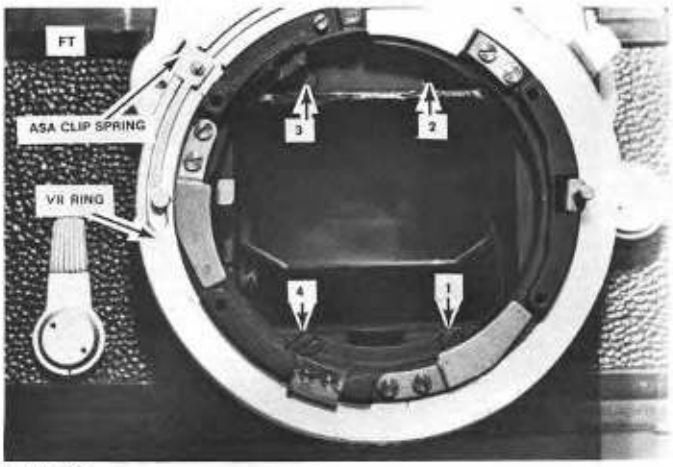


Figure 33

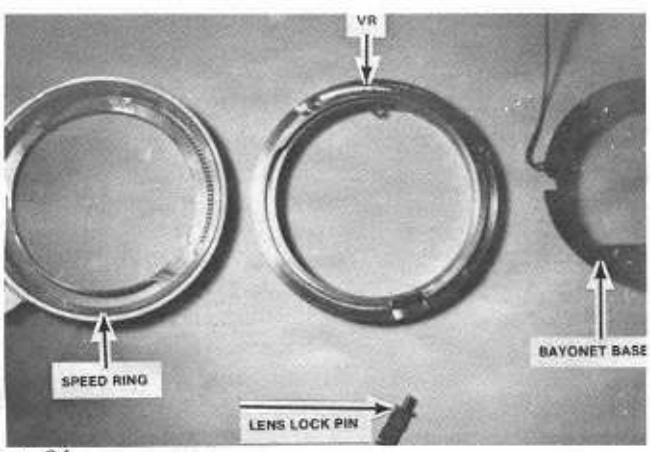


Figure 34

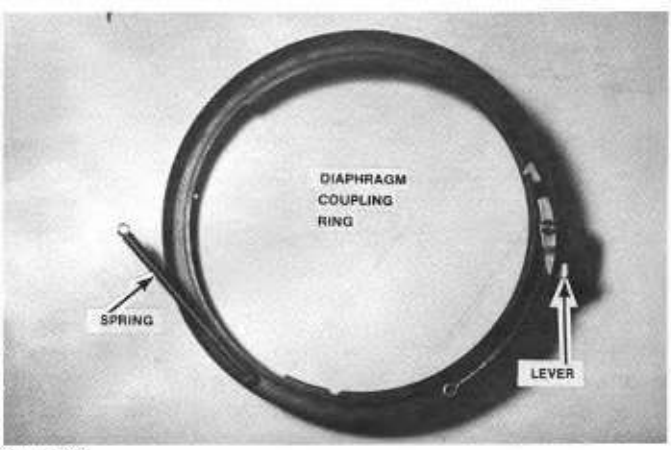


Figure 35

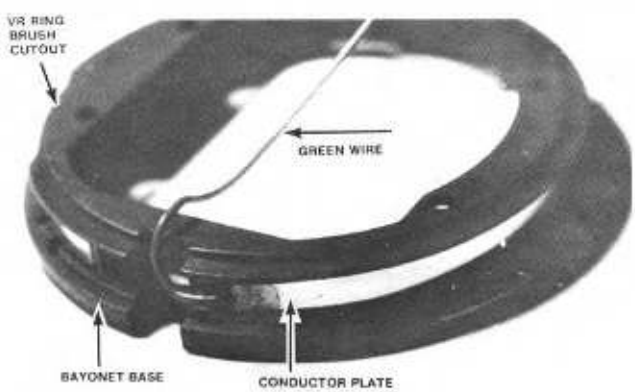


Figure 36

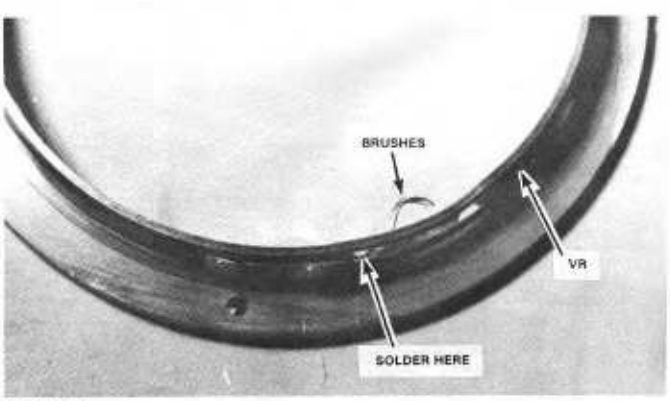


Figure 37

leasing the right-side coupling lever, the mirror will go up. Pushing the side signal will allow the set lever to release the coupling lever. This allows the mirror-down lever to return the mirror to the viewing position.

Now for a step-by-step explanation. The right-side coupling lever is held by its latch in the bottom of the camera body. When cocking the camera, the rack pushes the mirror-cocking lever against the bottom coupling lever, which is latched by the set lever. When the release shaft is pressed, it pushes the large see-saw lever down which releases the coupling lever latch. This allows the right-side coupling lever to move forward. And this allows the mirror-up spring and lever to raise the mirror plate.

When the mirror is almost to the top, the left coupler lever has traveled far enough to release the shutter. When the second blade of the Copal Square shutter has covered the focal plane aperture following the exposure, another part of the shutter mechanism pushes against the side signal lever which in turn allows the set lever to release the bottom coupling lever. This allows the mirror-down lever to return to the released position and lowers the mirror plate. There are a few modifications to the mirror box that are easy to understand. Some levers were not covered but they can be figured out by using the stop-down lever and mirror-lock-up. Also not covered were the speed indicator parts and strings.

An easy way to install the mirror box is to first set the speed ring to "B," then place the mirror-up holding lever under the see-saw lever and, without letting go, press and hold down the release shaft. This will hold all the release parts in their proper places while installing the mirror box. Check the cocking and releasing and self-timer operations before installing all of the mirror box-front plate retaining screws.

Front Rings and the Variable Resistor

Remove four screws and lift off the bayonet mounting ring from the bayonet, Fig. 30. There is a spring under the bayonet that is easily lost, Fig. 31, and should be removed. The diaphragm-coupling ring has a long spring under it that is attached to the pin on the VR ring, Fig. 32.

Figure 33 shows an Ft variable resistor and the ASA clip spring for changing maximum aperture. Push in on the spring to change the setting. The pin on the ASA Spring wears out and should be replaced if necessary. Remove the four bayonet base screws, Fig. 33, and lift the rings up together. Figure 34 shows the three pieces in order of disassembly. Figure 35 shows an FTn diaphragm-coupling ring with its spring still attached.

To automatically index a lens, set the lens to f/5.6. The diaphragm-coupling ring should be at the spring-click stop. Put the lens on with the lens coupler and diaphragm-coupler-ring pin lined up. As the lens diaphragm is turned counter-clockwise, the ratchet-release plate presses the lever under the diaphragm coupler and the long spring pulls the variable resistor ring around to past 5.6 in the side cutout of the diaphragm-coupling ring. Then, as you turn the lens diaphragm clockwise to the maximum aperture, the lever of the diaphragm-coupling ring locks into the variable resistor ring and the maximum aperture is set. If it doesn't work right, suspect either dirt or grease as the cause.

Figure 36 shows the bayonet base and conductor strip. The conductor strip, at times, becomes unglued or tarnishes. It's best to replace it with a new one. Remove the old glue and use Pliobond to fasten the new one in place. Secure it with a rubber band until it dries.

Figure 37 shows the variable resistor ring. Sometimes the carbon on the VR is ok, but the brushes are loose and can cause the needle to jump when speeds or f/stops are changed. Brushes can be repaired by applying some flux and using a little solder. Then bend the brushes inward and see if it works. Note that there are two types of variable resistors, one for the Ft and one for the FTn. They come in black and chrome. There are at least three types of bayonet bases, so use the proper replacement.

Loose Ends

Since the camera is so modular, it is easy to tell where and what the problems are. The order of meter troubles, from most common to rare, is: battery, switch, variable-resistor ring, meter coil, cells, and wire.

Some cameras come in jammed and it helps to remove the bottom cover and remove the rack. If the camera can now be wound and released, the jam is on the bottom. If still jammed, the problem is on the top section.

If the jam is on the bottom, cock the shutter and cock the mirror box with a pair of tweezers. If the rack is replaced and the shutter is cocked—and still nothing happens—the problem most likely is in the mirror box. If the mirror goes up when the release button is pressed, but the shutter doesn't release, the problem's in the shutter. Happy repairing!!

THE BARGAIN BOX

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